Hofstaðir 1999

Framvinduskýrslur/Interim Report

Edited by Gavin Lucas

With Contributions by

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Fornleifastofnun Íslands
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1. INTRODUCTION

Archaeological Investigations at Hofstaðir in Mývatnssveit ran into their fifth consecutive year this season, excluding the original survey in 1992. Last year, summaries of all previous work up to 1997 were published in the first issue of *Archaeologia Islandica*, a new journal specially dedicated to archaeological studies of Icelandic material (see Research Reports Section, *Archaeologia Islandica* 1: 58-142). The main foci of investigation in 1999 were firstly, at the southern end of the long hall where previously un-connected trenches (Areas A, D and G) were conjoined and expanded, and second, on the edge of the farm mound on the site of the chapel (Area Z). In addition, the use of geophysical survey for the first time marked a major step forward in the methods used on the site, and enabled the exact location of the chapel and churchyard boundary (previously levelled earlier this century) to be located. The primary aims of the season were to complete the excavation of Areas D and G which were accomplished except for some work still needed in G; in addition, further structures and complex sequences of construction and use were identified to the southeast of the longhouse (Areas A & AB). Area Z, despite much of its upper horizons having being bulldozed, revealed the remnants of a structure in the position of the chapel and the presence of numerous graves with excellent bone preservation.

The 1999 season of excavations at Hofstaðir saw the largest team yet on the site with a total of twenty students from North America, Iceland, Sweden, Spain and Finland as part of the fieldschool run at the site (Colin Amundsen, Michelle Besson, James Boyle, Elín Hreiðarsdóttir, Federico Fiondella, Adriana Franco de Sa, Ashley Hazel, Eugene Lewis, Andrew Leykam, Linda Livolsi, Ruth Maher, Daniel McGovern, Jessica McNeil, Kevin Mears, Neus Piqué, Connie Rocklein, Elin Simonsson, Kasia Solon, Sophie Åkerman Thomsen and Johanna Vuolteenaho). Upto eleven Institute staff were present for variable periods of time (Oscar Aldred, Jenny Bredenberg, Ragnar Edvardsson, Adolf Fridriksson, Hildur Gestsdóttir, Garðar Guðmundson, Gavin Lucas, Howell Roberts, Mjoll Snaesdottir, Orri Vésteinsson and Magnús Sigurgeirsson). Further, Professor Tom McGovern from Hunter College, New York was also present and continues to oversee the analysis of faunal remains from the site with the assistance of Clayton Tinsley who, due to tragic circumstances, was unable to participate in the excavation this year. The soil scientist Dr. Ian Simpson (University of Stirling) also returned along with Karen Milek, the PhD Student from the University of Cambridge who took further micromorphology samples and assisted with fieldwork while Tim Horsely, an MA student from the University of Bradford, conducted the resistivity and magnetometer surveys over part of the site for the duration of the season. Their work is also included in this report alongside the excavation results.

In this report, the following conventions are employed: context numbers are placed in square brackets (e.g. [0003]) and finds numbers in arrow brackets (e.g. <99-323>). Earlier conventions often denoted context numbers with the prefix C (e.g. C9) and some examples may still be found in this report. However, this has been discontinued to follow the standard conventions used in Single Context Recording shown above; the use of C is additionally confusing in that sometimes the Area code is prefixed to the context and as Area C will be used in forthcoming seasons, this may cause confusion.

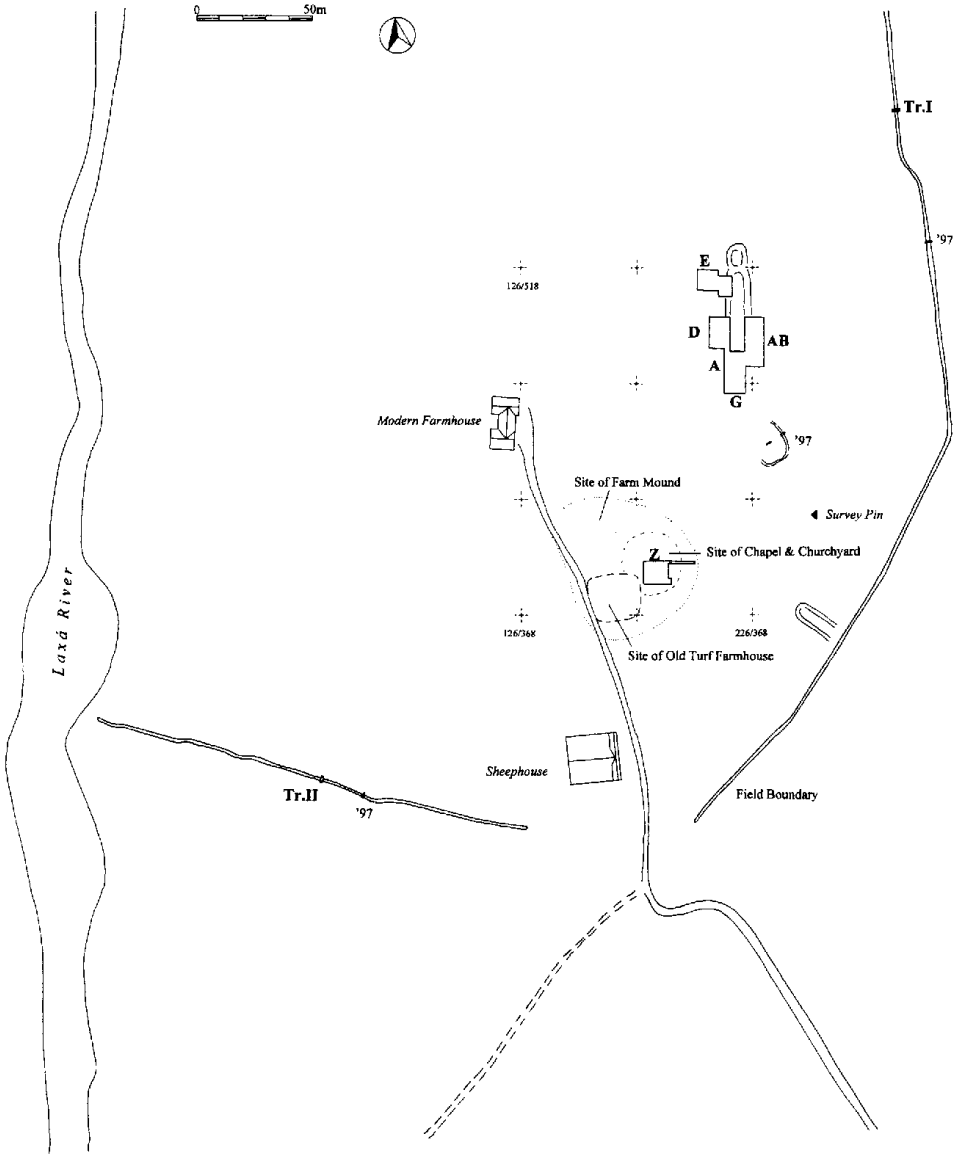


Figure 1.1 Site Plan

Figure 1.1 Site Plan

2. GEOPHYSICAL SURVEY (T. HORSLEY)

T. J. Horsley (Dept. of Archaeological Sciences, University of Bradford, UK)

2.1 BACKGROUND

Due to the recent research interests at Hofstaðir, work has been undertaken at this site to investigate the archaeological sediments, tephrochronology and site formation processes, providing a valuable contribution for the understanding of the results of geophysical processes. The region around Lake Mývatn lies on the Ódádahraun lava fields (Hjálmarsson & Astridge 1998). The proximity of the farm to Mývatn and the Mid-Atlantic Ridge means that this basalt will be quite recent, less than 10,000 years old (ibid.). Although the area of the present homefield is generally level, both excavation and geophysical evidence at Hofstaðir show that the depth of soil down to the geology is quite varied. In one place, auguring revealed that solid rock was only 0.2m below the surface, while the 1999 excavation of the pit house only *c*.60m away, extended to a depth of almost 2m and had not hit bedrock. Archaeological deposits at Hofstaðir are sealed between layers of aeolian deposits, including sands and tephras (Sigurgeirsson 1998; Simpson et al. 1998).

2.2 THE SURVEY AREAS

2.21 Surface Evidence

A variety of surface features exist at Hofstaðir providing some evidence for the subsurface archaeology. These include the walls of the Viking Age longhouse, the farm mound, turf boundary banks and other slight earthworks indicating the sites of former structures associated with the farm. Many of these features are visible, and shown in the survey grid plans. Still in use, the present day homefield is relatively flat and free of *thufur* (i.e. frost hummocks), although in places there are bands of parallel ruts, similar to those caused by ploughing, but may be artefacts of turf-cutting (Friðriksson, pers. comm.). Around the eastern perimeter of the farm mound the ground is quite disturbed by many well-formed *thufur* and at the time of survey this area stood out due to the bright yellow flowers of numerous buttercups. The rest of the farm mound is not mown due to the uneven ground and as a result is colonised by well-established grasses. The wetsern edge of the farm mound roughly coincides with the modern track that passes over the top, although it is not known whether buried structures exist on this western side.

One of the archaeological aims of the geophysical survey was to attempt to locate the remains of a church known to have existed on the eastern side of the farm mound. There are no surface indications for the location of this or a churchyard. The longhouse and adjoining structure to the north are clearly visible as earthworks and previously excavated structures have been covered with turves so that their form is still recognizable. 50m to the west of the longhouse (at the grid intersection marked H2), there is a slight mound and geophysical surveys were extended to include this area. A midden is recorded as having existed in this area and other buried structures might also be present (Vésteinsson, pers. comm.).

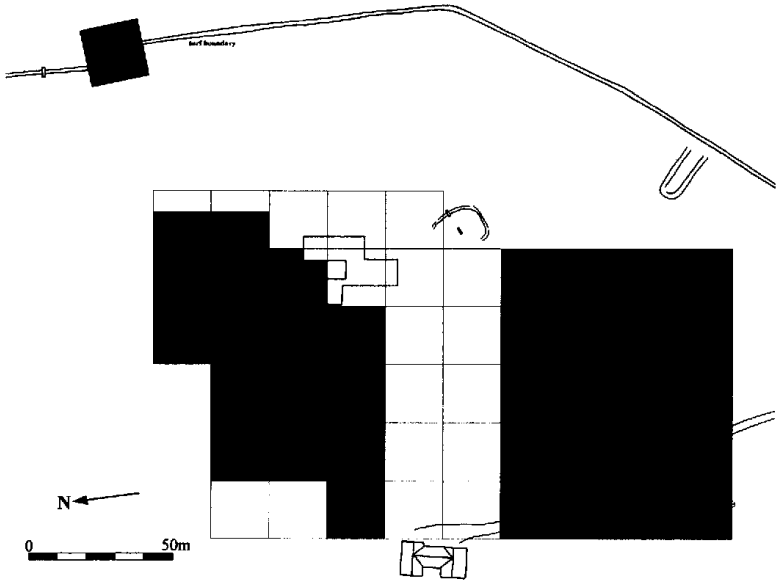


FIGURE 2.1: magnetometer survey grid relative to surface features and excavation trenches (source: author).

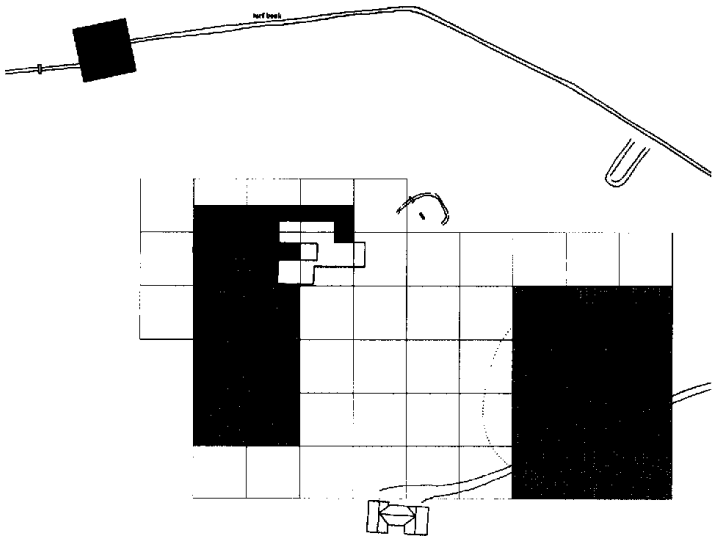


Figure 2.2: earth resistance survey grid relative to surface features and excavation trenches (source: author).

2.3 FARM MOUND RESULTS

2.31 Magnetometer Results

The results of the fluxgate gradiometer survey are presented in figures 2.3 and 2.4. The data was collected in the 'zig-zag' fashion and as a result the plots suffer quite severe bunching effects. This is especially noticed around the intense anomalies caused by the background geology. While the data would be free of this defect had a 'parallel' approach been adopted, it is the small-scale jumbled noise detected which is of interest and the striping does not detract from this archaeological information. By walking 'zig-zag' a greater survey area was covered at Hofstaðir, however it is recommended that future magnetometer surveys be conducted in a different manner.

As previous surveys have shown, the intense geological anomalies limit the type of archaeological features which can be detected and it is often the smaller scale jumble of magnetic dipoles due to individual rocks that provide useful information. This is certainly true of these results. A low-pass (Gaussian) filter was employed in an attempt to remove the bunching discussed above, however it was found that this also reduced the small-scale detail, resulting in a loss of information. Therefore, the only processing applied was to interpolate the data (x2 in the Y-direction) to increase the resolution to 0.25 x 0.25m. The result shown in Fig. 2.4a has been to smooth the data a little, compared to figure 2.3b and retained the detail.

The interpretation (fig.2.4b) simply indicates the areas of small-scale magnetic noise and the identifiable anomalies of the modern track and two buried pipes. The general area of magnetic noise corresponds well to the area of the farm mound and it is interpreted that the more dense areas are due to clusters of rocks and might therefore indicate the sites of buried structural remains. Some rectilinear features can be made out within the noise, but it is difficult to make any firm conclusions. A large area to the west of the farm mound is free of this noise and while this might be indicative of a lack of loose rock debris in this area, it cannot be concluded that this is free of any archaeological activity. Subtle anomalies might be present that are overwhelmed by the igneous geology.

2.32 Earth Resistance Results

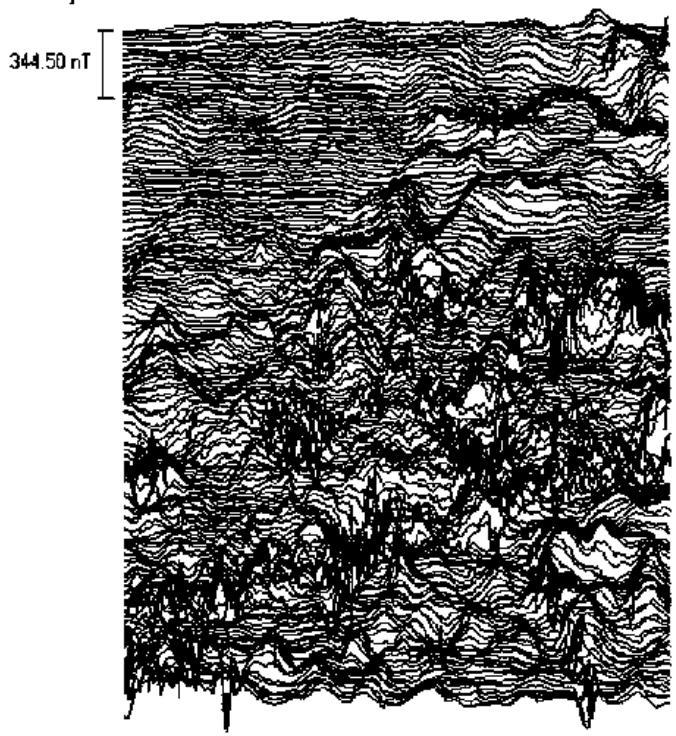
The results of the earth resistance survey over the farm mound are presented in figures 2.5 and 2.6 and the location of the survey in fig. 2.2. The survey was conducted at the high resolution of 0.5 x 0.5m to record a maximum level of information. The traceplot of the raw data (fig. 2.6a) reveals a high number of resistance anomalies not only associated with the track but also in the area of the farm mound. Another high resistance anomaly stands alone to the west of the track. Figure 2.6b reveals that many of these anomalies have a regular form with some linear and rectilinear features visible. These are interpreted as being the responses to buried stone foundations for structures originally in these location.

As stated above, one of the aims of the surveys in this area was to locate any features associated with a church and this has been achieved. A high resistance anomaly has been detected to the east of the main cluster and in the area where the church was expected. Almost rectilinear, this anomaly could be structural in origin but with anomalies only detected on three of four sides. Although oriented east-west and about 6 x 4m, on its own this rather amorphous anomaly cannot be confidently identified as a church. However it is seen to be

Geophysical Surveys at Hofstaðir, Mývatnssveit, August 1999.

Figure 2.3: Farm Mound – Fluxgate gradiometer data.

Traceplot of raw data



b) Greyscale of raw data

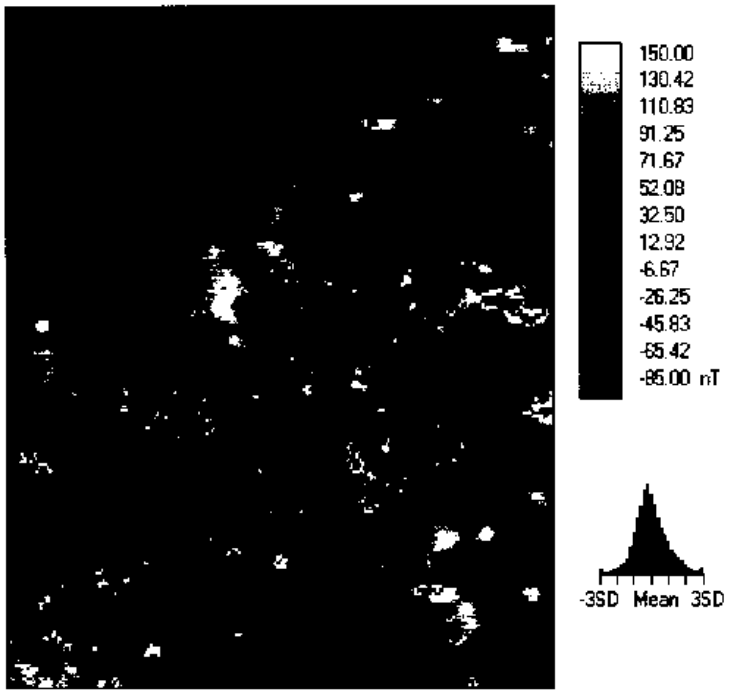
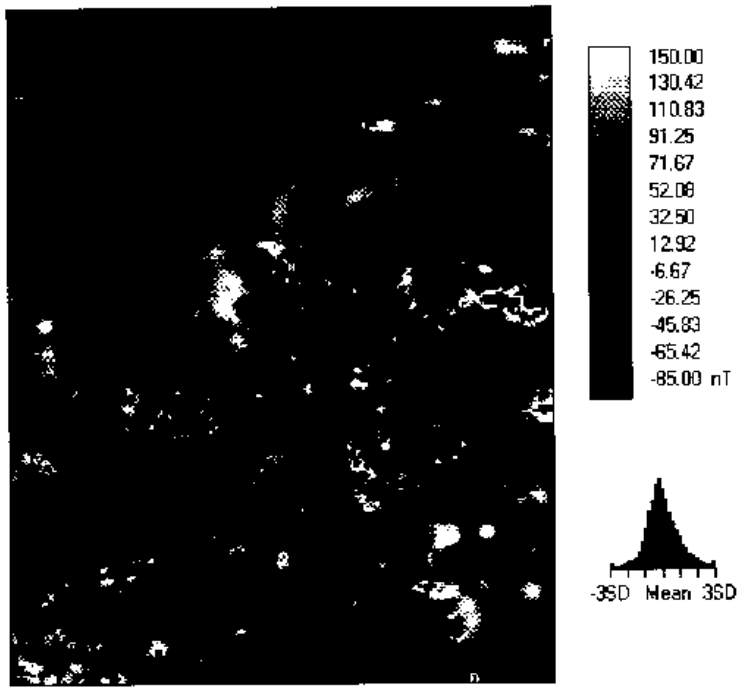
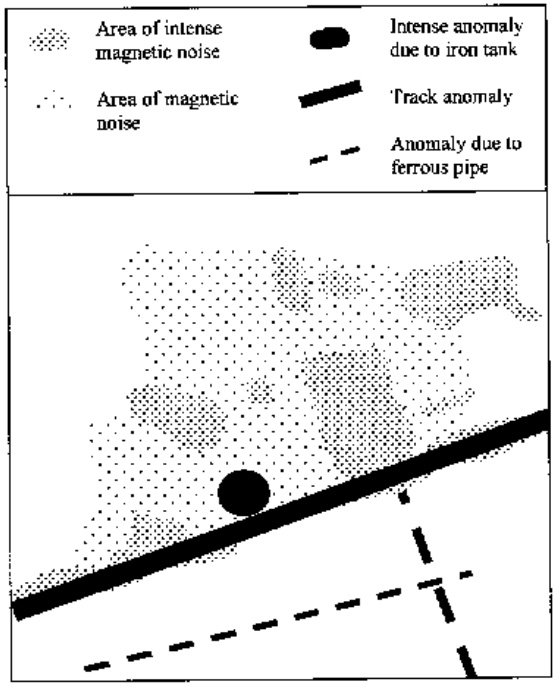


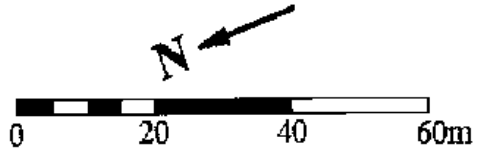
Figure 2.4: Farm Mound – Fluxgate gradiometer data.

a) Greyscale of interpolated data



b) Interpretation



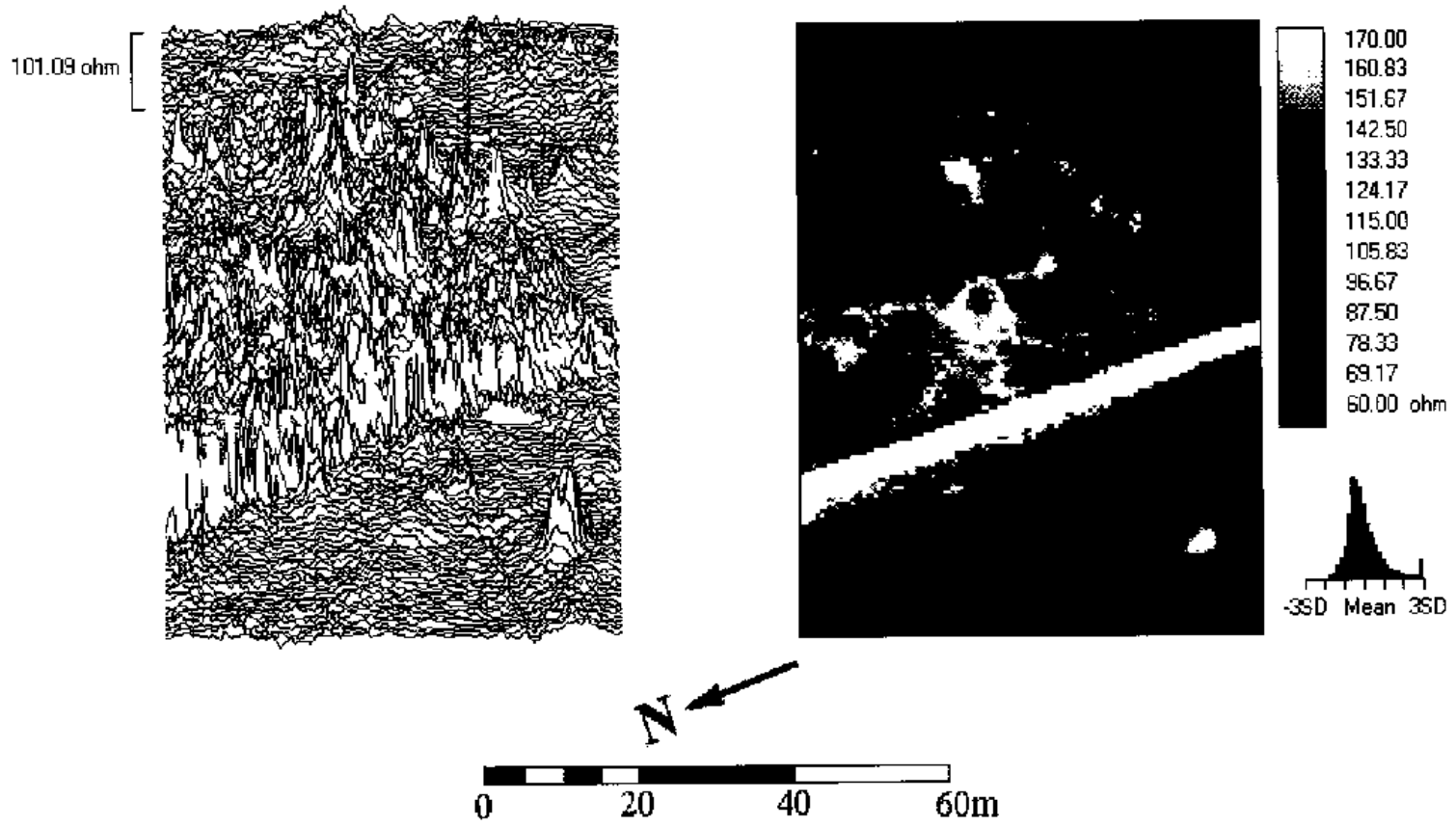


Geophysical Surveys at Hofstaðir, Mývatnssveit, August 1999.

Figure2.5: Farm Mound – Earth resistance data (0.5m probe spacing).

a) Traceplot of raw data

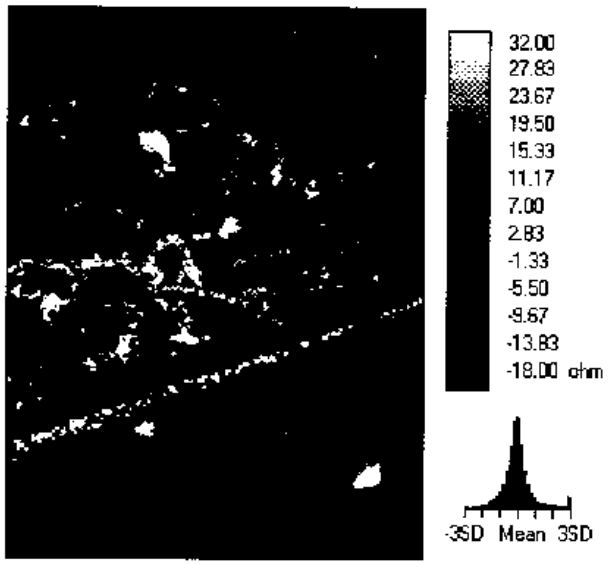
b) Greyscale of data after edgematching and despiking



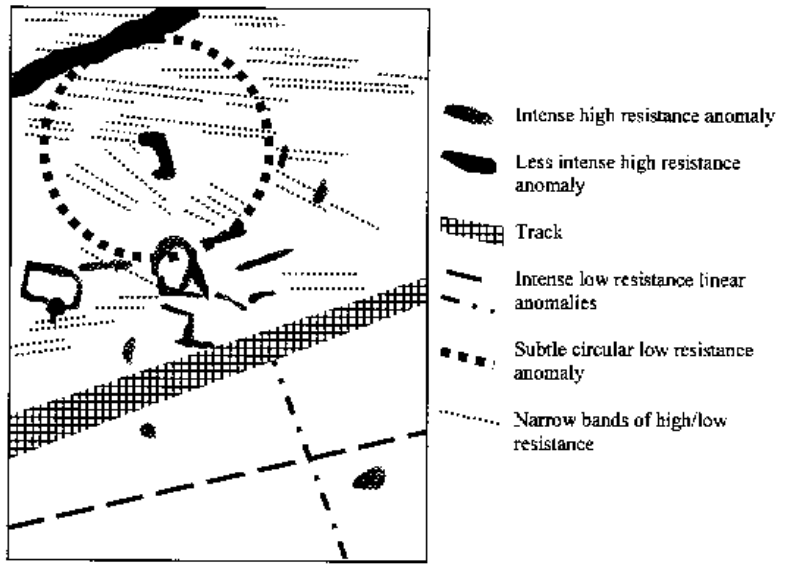
Geophysical Surveys at Hofstaðir, Mývatnssveit. August 1999.

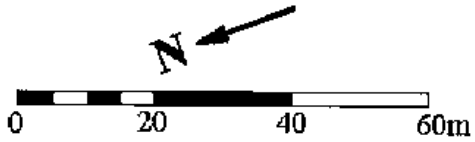
Figure 2.6: Farm Mound - earth resistance data (0.5m probe separation).

a) Greyscale of high-pass (Gaussian) filtered, and interpolated data



b) Interpretation





situated in the centre of a circular anomaly of low resistance about 30m in diameter. This ring of low resistance might be due to an infilled boundary ditch. These two anomalies together are interpreted as being due to a church in the middle of a churchyard, later confirmed by excavation (see Chapter 3), when a number of graves were revealed.

A very subtle positive linear anomaly can be made out in the northeastern corner of the survey area, and might be due to the buried remains of a bank, possibly a field boundary. Two linear low resistance anomalies have been detected to the west of the track, which would be interpreted as infilled ditches. These coincide with positions of the ferrous pipe anomalies seen in the gradiometer survey and can be positively identified as the response to these modern pipe trenches. Within the survey area to the west of the track, a number of linear high and low resistance stripes are visible. These are real anomalies and not survey defects and can be seen to be on a slightly different orientation to the survey grid. During the data collection, a number of linear depressions were noted on the farm mound, probably caused by tread marks of a bulldozer employed to level buildings on the farm in the 1970s. These would certainly produce anomalies like those detected. The cause of the high resistance anomaly on the western side of the track is not clear although interprets as natural, probably due to near-surface geology (a similar anomaly has been detected in the earth resistance survey within the longhouse survey area and proven to be geological). However when this area was tested with a an augur the bedrock was found to be deeper than 1m. The only obvious difference in this area was a thicker deposit of the V-1477 tephra at a depth of 20-30cm. This sandy deposit may be better drained than the surrounding soil and so cause an area of higher resistance.

When the results of geophysical surveys over the farm mound are compared with each other, it can be seen that the gradiometer survey has successfully detected the church anomaly as one of the areas of intense dipole anomalies. The other anomalous areas can then also be confidently interpreted as being due to buried structural remains, as they too coincide with areas of high resistance.

2.33 Other Results

Other surveys were also conducted over the remains of the longhouse to see if buried turf walls could be detected. Anomalies were recorded in this area but it is unclear whether these may be attributed to the archaeological remains or instead to the excavation trench of 1908. A slight mound visible in the homefield was surveyed in order to see if it was natural or anthropogenic in origin. Both the earth resistance and fluxgate gradiometer results indicated that it was natural and the augur revealed bedrock at a depth of 20cm.

2.4 General Magnetic Susceptibilty Comments

Soil samples were collected at Hofstaðir for a comparison of the magnetic susceptibilities for different archaeological and natural deposits. The location from where samples were collected with the augur (H1-H4) are shown in fig.2.1. Samples H1.1-1.7 were collected at depths through a soil profile where no buried archaeological features were apparent to assess the background variation. These can be seen to be relatively low when compared to those associated with archaeological deposits or the rocks. The white silicic tephra Hekla-3 has produced the lowest reading. The results are given in table 2.1 and show that many of the soil samples with anthropogenic input (H2, peatash, 172A and the slag) all possess an enhanced susceptibility to the natural sand sediments. However there is less contrast with the rock and black 1477 tephra samples.

All the samples measured here have been sieved during their preparation and this clearly pays off when rock susceptibility values are seen. Even small fragments of basalt in a soil sample would dramatically influence the results. It can also be seen that, although generally lower than the rocks, tephra and anthropogenic samples, the samples of natural aeolian deposits display a significant variation of their own. This might make interpreting an enhanced susceptibility for a sediment difficult. One conclusion that may be drawn from this is that a survey with a field coil might produce spurious readings in an area survey as it will be unable to discriminate between high readings due to anthropogenic enhancement and those where rocks were within the area measured. The sample removed from a deposit of collapsed turf shows no enhancement, despite containing the dark Landam tephra sequence. These tephra deposits may be too small to have an effect on the overall measurement although based on one sample it is impossible to make any firm conclusions.

Sample	**Description (and depth where appropriate)**	**Magnetic Susceptibility (x10-8m3kg-1)**
H1.1	Below turf (5-10cm)	103
H1.2	10-20cm	115
H1.3	20-30cm	118
H1.4	30-40cm	79.3
H1.5	40-50cm	63.5
H1.6	Hekla-3 (60cm)	33.9
H1.7	Wet clay (75-100cm)	170
H2	Peat and charcoal layers (25cm)	269
H3	Black sand/1477 tephra (25cm)	171
H4	Natural	88.9
1477 tephra	1477 tephra deposit	186
Natural	Aeolian sand below 1477 tephra	120
[172a]	Excavated domestic deposit	311
[155]	Turf debris	69.7
Peat ash	Peat ash	1090
H slag	Iron slag	3590
R1	Basaltic rock	1240
R2	Basaltic rock	826

Table 2.1 Magnetic Susceptibility measurements from Hofstaðir

2.5 Survey Outcomes

Geophysical surveys within the farm of Hofstaðir have proved successful not only for the detection of anomalies, but also for the interpretation and assessment of buried remains at the site, therefore improving the archaeological understanding of the site. Undertaking surveys at Hofstaðir over four weeks and directly comparing many of these results with real archaeological evidence has made it possible to form a proper assessment of these archaeological prospection techniques both at this site and others studied. Resistance anomalies have been detected and subsequently confirmed by excavation, indicating that this technique has the potential to locate and identify cut features into sediments, in addition to the more obvious stone feautres. There are no clear anomalies corresponding to the positions of graves revealed in excavation. The results of the earth resistance survey and excavation have confirmed the results of the radiometer survey for the detection of structural remains and indicate that this technique might be used in an initial reconnaissance survey for such areas, to be followed up by an earth resistance survey.

3. EXCAVATION RESULTS

R. Edvardsson, H. Gestsdóttir, G. Lucas and O. Vésteinsson (Fornleifastofnun Íslands, Reykjavik, Iceland)

3.1 THE VIKING SETTLEMENT (R. EDVARDSSON, G. LUCAS & O. VÉSTEINSSON)

3.11 Area A (GL)

An area which had been de-turfed in 1998 but no further investigated was examined this year and also extended to the east. This was the area over the nineteenth century silo and turf and stone outhouse associated with the farm-mound, which had disturbed earlier structures. Excavation found the southern extent of all these features, but they still continued eastward and upslope beyond the limit of the trench.

3.111 Structure A1

At present, the nineteenth century structure (A1) remains the most confusing part of the sequence because of its siting in pit [108] and its subsequent abandonment which may have involved deliberate demolition. The present interpretation of its construction involves a rectilinear cut [110] which ran east-west into the slope, thus being shallower at the western end and deeper at the east. 3.1m wide and running for at least 5.7m and continuing beyond the limit of excavation, within the cut lay the remains of turf walls and a floor. The walls were variable in their survival - the best section lay along the northern side toward the east and consisted of turf strengur one width thick (c. 0.3m) and standing *c*. 1m high [105]. This was recorded in 1998 and thought to stop at the limit of the pit [108]; however, it narrows increasingly toward the west and in all likelihood, it originally continued further west (as marked by the floor and stones - see below) but had completely collapsed or been levelled. On the southern side, the wall was much less well-preserved, only a low stump in the eastern limit of excavation was identified. However, behind it and visible along the edge of the cut for the structure was a good line of vertically stacked turf *c*. 0.5m thick. A similar space between the northern wall and the edge of the cut was filled by horizontal turves. The walls thus appear to consist of a thin, internal skin with less regularly laid turf as packing between them and the sides of the cut. No western end wall was found for the same reasons as the northern wall petered out, for the western end was very close to the present ground surface. It is possible however that this end had no wall but was open (see below).

Between the walls lay a thick turf floor [100] above which was a continuous row of stones, again most clearly defined on the northern side; along the southern side they were more dispersed and at the western end, though dense, less regular. It is possible the structure was re-floored at some point but this needs to be confirmed. Upon abandonment this structure was used as a midden dump and filled by the finds rich deposit [107], the remaining part of which was hand sieved this season. Material retrieved suggests a 19th century date for its abandonment and the structure itself is probably not much older. The structure is not very substantial - the walls are thin and the interior space fairly narrow - not much more than a metre wide. In all probability, it is an outhouse associated with the main farm mound, probably a sheephouse given its size. It clearly utilized the natural slope and the hollow left by the half-filled up pit [108] in its siting and construction and may have been open at the western end.

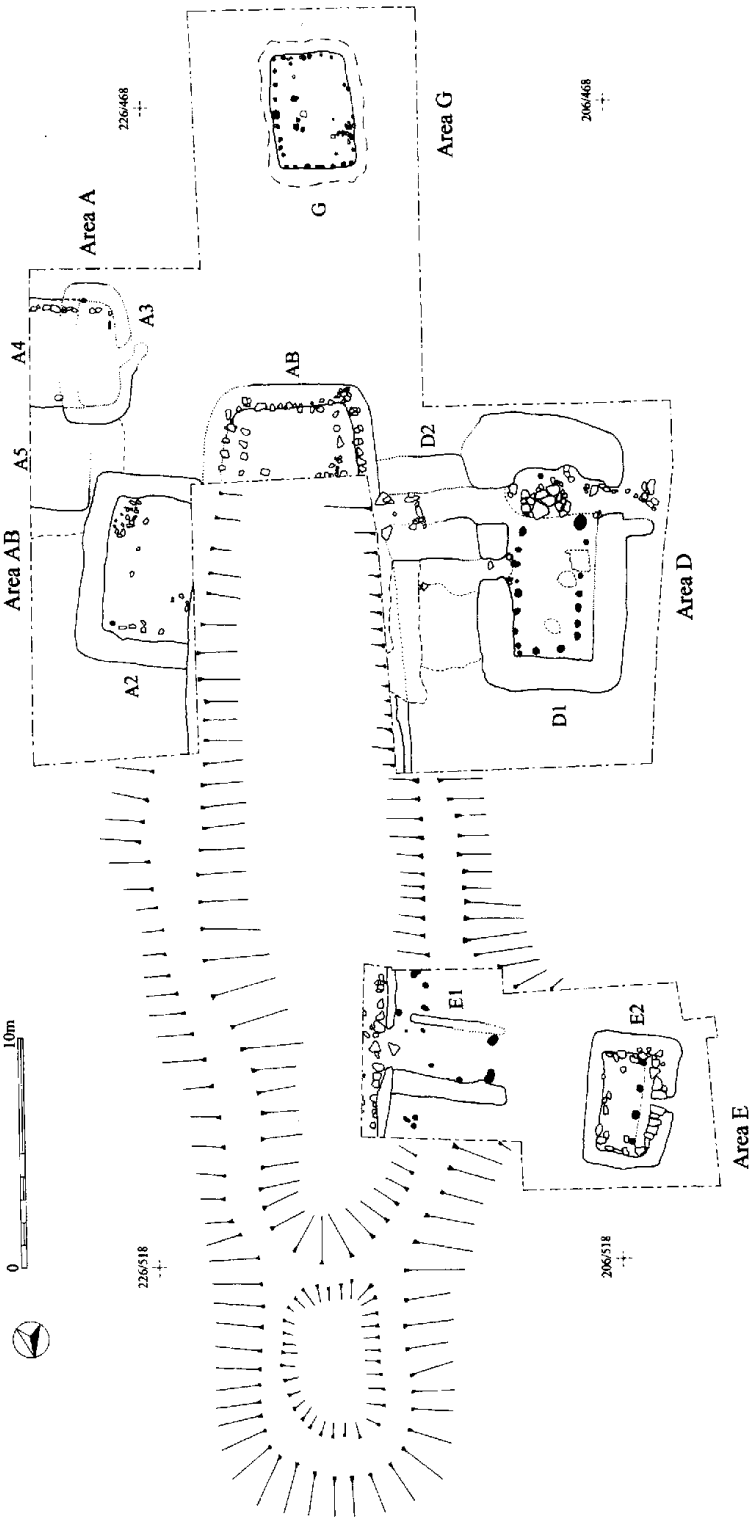


Figure 3.1 Viking Settlement

3.112 Pit [108]

Beneath structure A1 was a large pit, currently interpreted as a hay silo. Three of four sides have been exposed, only the eastern limit remains to be located; essentially sub-square or rectangular in shape, 4m wide by 4+m long, it has vertically cut sides to a depth of *c*. 0.8m and a flat base, in which sat a thin compacted layer [178], possibly a turf floor. In 1998, ostensible beam slots were identified in the base of the pit as well as animal burrowing; these 'slots' subsequently proved to be fictive and part of burrow runs. Most of the pit, beneath the level of Structure A1, was filled by [115], a very mixed deposit, but several more discrete deposits of turf collapse were noted along the southern side ([153], [158]) and the western side ([139], [151]). During excavation, it was difficult to be sure whether these deposits belonged to the structure A1 or the pit, especially given the nature of the stacked turves along the southern side of A1. Finds in the base of the pit suggest a nineteenth century date, at least for its abandonment.

3.113 Structure A3

The pit [108] cut into a Viking period structure (A3), a small turf walled rectangular building measuring 6m long north/south by *c*. 4m wide with an entrance facing west. Its back (eastern) wall and floor appears to have been cut away by the pit [108], as was any former internal fill, but the northern, southern and western parts of the wall remained intact [126] as did external collapse ([182], [184], [191], and [198]) and material infilling the doorway [195].

3.114 Structure A4

Underneath structure A3 are traces of an even earlier, sunken floored building, A4. This lies parallel and adjacent to another, A5 (see Area AB below) and at present measures 4.5m wide by 3.5m+ long and extends to a depth of *c*. 0.35m. Again, much of the floor of this appears to have been truncated by the base of the pit [108], but patches of ashy material [207] survived, especially in the animal burrows and some turf collapse in the centre. The ashy material was also recorded in 1998 as [117] and interpreted as contemporary with the pit [108], but this year it was shown to lie under undisturbed turf collapse lying along the lower sides suggesting it belongs to this earlier structure. These internal edge deposits ([185] and [176]) were also present with upcast dumps ([175] and [193]) and probably represent collapse and slippage from the sides into the structure at the end of its life prior to the construction of A3.

3.115 Area A Context descriptions

Context	Type	Description	Notes
0139	Fill	Friable, Mid brown, Silt with some pebbles, occasional large rocks	Truncated by last year´s excavation of area; either backfill of pit--or more probably, slumped fill over wall
0151	Structural Element	Compacted soil with tephra; red-orange, light brown, brown, green-grey colored layers running N-S 1-1.5cm in width; silty soil; 2 stones E side of wall	Turf and stone wall , appears to have been truncated by later bldgs--and last year´s excavation
0152	Cut	Semicircular, No real corners, 170cm wide x 112cm long; west wall 38cm deep/east wall 26cm deep, gently sloping	either cut or depression in [115]--probably latter
0153	Layer	Firm, Greenish-gray, light-brown, medium brown, and red-orange turf layers, Silt, Gravel, pebbles	Turf collapse--beneath structure A1
0157	Layer	Greenish gray (1cm), mid-brown (2.5cm), light-brown (1.70cm), dark brown (4cm), firm with soft areas, silty, turf, Lengthwise turf and areas of mixed collapse	Turf wall collapse; 2 rocks along collapse area--(17x14x12cm) and (21x8x11cm); lower part of [100]
0158	Layer	Soft, mixture of greenish gray, red orange,	Fill of silo; part of wall collapse of A1

		medium and light brown, and dark brown silty clay, irregular coursing	
0175	Layer	Friable, brown natural silt containing white prehistoric tephra (Hekla III), Some charcoal	Upcast
0176	Layer	Friable, Patchy--orange, dark-med-lt brown, yellow and greenish gray tephra, Silty turf--possible collapse	Uneven fill of cut
0178	Layer	Firm-->fairly compact, Variable--dark pinkish brown-->greenish brown, Silt with high fibrous/organic content	Truncated by 98´s excavation; compacted organic layer in base of silo pit, possibly deliberate surface layer, probably trample of organic material; decayed hay/turf content?
0182	Layer	Firm-->friable, Dark reddish brown, Silt with turf debris, Grey/green turf frags (degraded, up to 80mm) and very occasional small grit,	Equivalent to layer [113]?; tephra--LNL in turf, highly turbated/degraded; turf collapse along West and South of A3
0184	Layer	Firm-->friable, Mid-->dark reddish brown, Silt--with organic content, Turf fragments (up to 200mm)	Truncated at north by [110]; tephra--LNL in turf debris; turf debris? south of A3
0185	Layer	Compact--firm, friable, Greenish-grey, light and dark brown yellow--mix and Hekla III, Silty turf debris, Charcoal	Upper part has much small chunks of turf collapse; laying on top of upcast--turf debris; on north side of wall--internal turf collapse
0191	Layer	Firm and friable, Flecked, dark brown, Silt, Flecks of charcoal and occasional turf fragments and occasional small stone, and occasional flecks of tephra	Tephra disturbed--flecks of H3?; disuse--mixture of aeolian and cultural debris
0193	Layer	Friable--pretty soft, Medium and light brown Silt with Hekla III running patches through it, occasional turf fragments/charcoal, Tephra disturbed--spots of tephra and turf collapse running thru the layer	Upcast--possibly disturbed
0195	Layer	Firm, friable, Dark brown, Silt, Occasional flecks of tephra and occasional flecks of turf	Tephra--LNL in turf fragments; highly mixed layer over backfill of doorway, western wall, structure A3
0196	Layer	Firm and friable in most areas--some soft spots, Hekla III spotting, ashy-grey, pink, orange, dark grey, dark and medium brown, Dry and gritty silt, Stones (5cm^2), (3cm^2)--lots of charcoal, bones; two stones about 5cm^2 are burned; one large stone 15 x 10 x 5cm	Disturbed fill; animal burrows have contributed to the uneveness of the bottom
0198	Layer	Firm and friable, Mid to dark brown, Silt, Turf fragments	Truncated at north by [110]; highly mixed; Tephra--LNL sequence; possibly wall repair/wall weathering of structure A3 on SW corner
0207	Layer	Firm and friable with soft spots, Hekla III spotting; ashy-grey, orange, dark gray, and dark brown, and med brown--also very red areas, Dry and gritty silt, Stones (5cm^2)--lots of charcoal--very small amounts of bone; large area of multi-colored ash (about 10cm deep) (red, yellow, orange, black)	Disturbed fill; Animal burrows have contributed to the uneveness on bottom of pit
0208	Cut	Irregularly shaped, slightly rounded, 1.01m N-S, 1.65m E-W, 0.3m deep, very uneven, sloping	Not really a cut but animal burrowing or disturbance has created a void which has subsequently filled up.

3.12 Area AB (GL)

Area A was also extended northward along the outside of the long hall and subsequently called Area AB. In 1998, we found the southern edge of a structure A2; its size was estimated on the basis of surface contours thus determining the extent of area de-turfed and upon excavation, the full extent of this structure was uncovered. A small rectangular turf building attached to the main long hall, its excavation was completed right down to the floor which consisted of compacted natural and peatash deposits where a hollowed path marked the passageway into the long hall in the centre of the structure. The presence of a sunken-floored structure (A5)

which was speculated to have existed in 1998 on the basis of the overlying deposits, was also now confirmed this season by finding the northern and western edge of its cut.

3.121 Structure A2

Lying upslope from the main longhouse and untouched by Daniel Bruun, this structure offered the first real opportunity of excavating a relatively undisturbed Viking period structure at Hofstaðir. Measuring *c*. 8m by 4.5m, the 1m thick wall [125] survived only to a short height of 0.5m maximum and consisted of turf strengur (Figure 3.2). Continuous on three sides, it abutted the eastern longhouse wall which was located running along the western edge of the trench. Unfortunately, most of the juncture between these two structures had been cut away by Bruun in his excavation of the skáli, but sufficient depth at the base of the walls survived to enable the stratigraphic relationship to be established showing A2 to be later than the skáli. The floor of the structure was primarily natural (Landnám tephra [003]), but also patches of peatash [170] were found scattered in places, thickest at the western side where a hollowed depression marked the access into the structure from the skáli. Filling the structure were a series of turf collapse deposits: along the western side, clear turf debris from the skáli wall lay at the base of the sequence ([159], [160] and [187]). Lying on the surface of this layer were series of animal deposits including two semi-articulated sheep carcasses in a mixed deposit [154] and a cluster of cattle skulls in another mixed deposit [171] (Figure 3.3). Over these were two thicker layers of turf debris ([136] and [155]) probably deriving from the collapse of structure A2. A number of external turf debris deposits were also excavated, some associated with A2 ([134], [137] and [179]) but most were linked to the longhouse.

3.122 Skali/Structure AB

The longhouse wall was traced along most of the western edge of our trench, but had been severely truncated by Bruun leaving only a thin spine left measuring between 0.3-0.4m wide and 0.25m high. It showed the same herringbone construction as noted elsewhere and by Bruun and its distinctive turves incorporating landnám tephra. A large portion of this wall had collapsed more or less intact, face down just north of A2 [156] and at first it seemed as if it was an *in situ* wall. Directly sealed beneath this wall lay a complete cattle skull with the horns cut off; like others found around the skáli, it probably originally hung on the outside of the wall and fell off as this section of the wall collapsed.

Fanning out from the main wall and beneath this collapse were a large number of interleaving and alternating layers of turf debris, aeolian soil, decayed hay and sheet midden suggestive of seasonal or periodic activities around the leeward side of the skáli. The turf debris ([135], [138], [173], [183], [189] and [203]) probably represents both weathered turf and dumps of old turf after repairs; indeed, in one place just east of A2 were a series of ‘imprints’ left on the landnám layer by the bases of regularly stacked and cut turves (measuring 0.8 by 0.2m) no doubt standing ready for use.

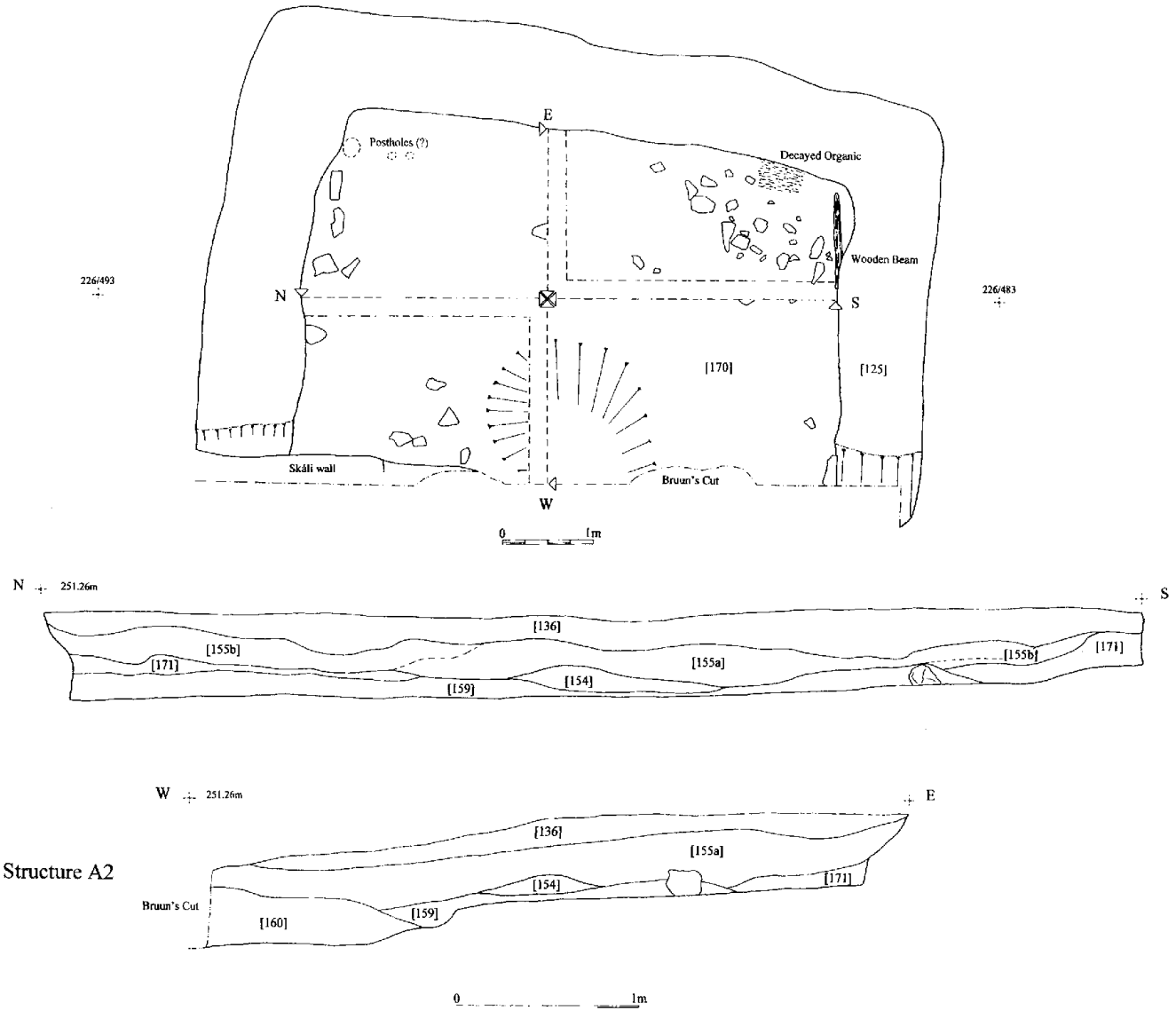


Figure 3.2 Structure A2

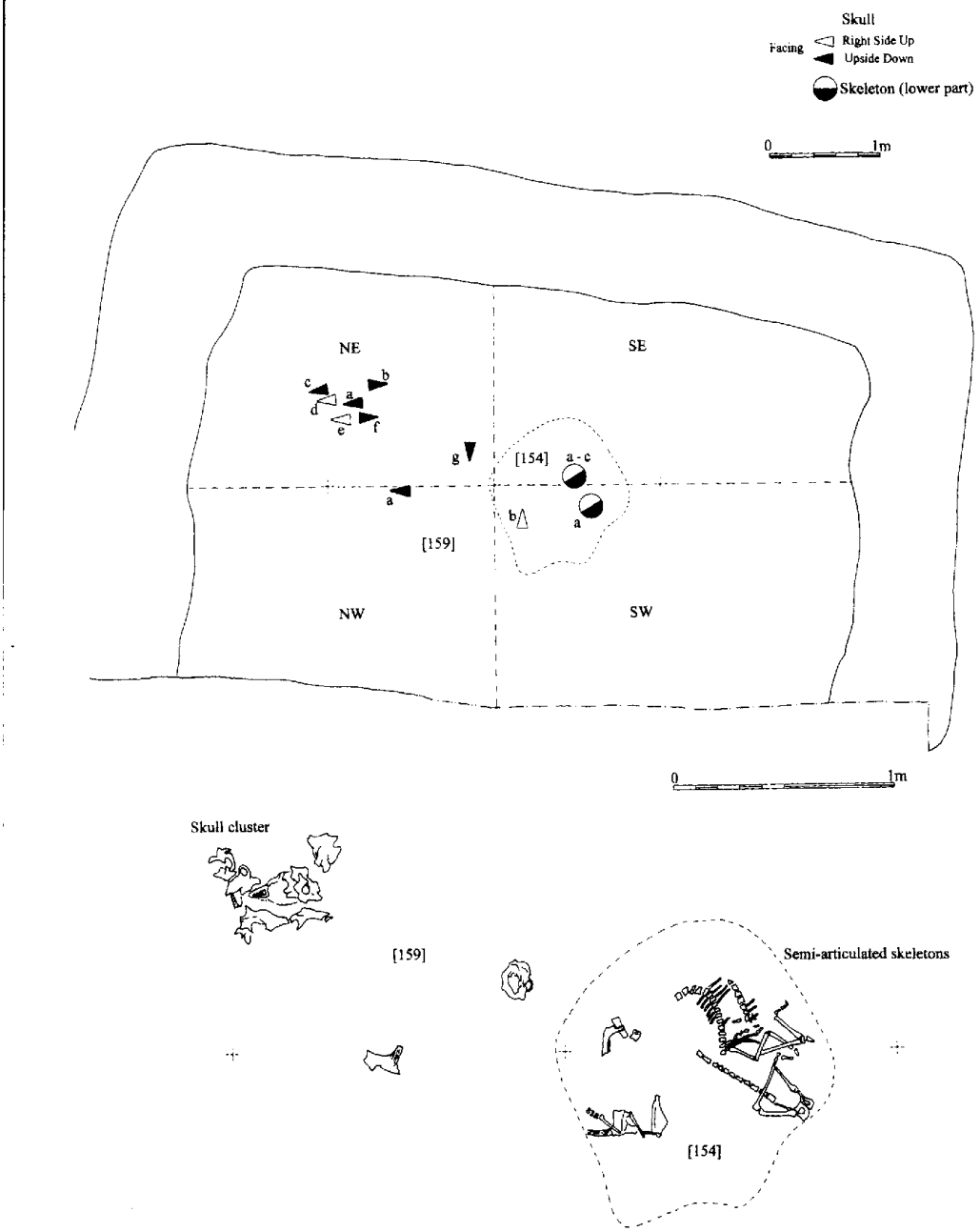


Figure 3.3 Animal deposits in Structure A2

The aeolian deposits ([169], [186], [197]) represent natural windblown material, while the hay layers ([174], [180]) may represent the remains of hay stacks. Finally, a number of charcoal rich, dark deposits, all macroscopically similar to [004] were excavated ([172], [181], [190], [192], [199] and [206]); given that at least *six* were identified, each separated by other layers, it supports the argument that there is not a single sheet midden around the site (e.g. ”C4”) and that care must be taken in extrapolating the significance of such layers across the site. Several layers still remain to be excavated, although in places, natural was reached. These layers probably represent periodic cleaning and scattering of material, perhaps also acting as surfacing. About half of all these layers also lip up against structure A2, but the remaining continue under its walls giving further useful stratigraphic information on the relation between the skáli and A2. The break is associated with one of the aeolian deposits [186], and it is these, culturally ‘quiet’ episodes that may be quite useful phase horizons. The uppermost aeolian deposit [169] predates the latest turf debris deposits, including all those associated with A2 and may mark the inception of abandonment of the all structures. The lowest aeolian deposit [197] possibly marks the difference between turf debris from construction/repair and turf debris from weathering of the skáli; until all the deposits have been excavated, this will however remain just one possibility.

3.123 Structure A5

Noted in 1998 as a depression in overlying deposits, the northern and western upper edge of a cut was located at the end of this season demarcating a sunken featured building similar and adjacent to A4. Sealing the structure and spreading northward were a number of layers of upcast ([177] and [204]) and turf debris ([188], [194], [200], [202], and [205]), some mixed with midden material, which probably represent the material redeposited in the original construction of the structure. The uppermost of these layers [177] continues under the wall of structure A2 [125] indicating that A5 is much earlier; the relation with A4 remains to be established.

3.124 Area AB Context Descriptions

Context	Type	Description	Notes
0127	Layer	Loose, dark grey fine sand	1477a tephra
0129	Layer	Compacted, Very dark purple, brown, Humic composition mixed with fine roots; fine silt with occasional ashy layers	Over tephra 1477; Ashy /deposited layer laying within the approximate area of supposed structure in AB and slightly to its E
0132	Layer	Friable, Very dark brown, Silt, Charcoal (1-5mm) <5% + burnt bone (<5mm),	Sits "within" limits of structure; in situ; sealed by context 1477 tephra; aeolian silt, but improved with ash etc--possibly used as agricultural soil--horticultural plot?; possibly same as [129]--soil improving occuring before and after 1477 fall
0132b	Layer	Friable, Mid and dark brown, mottled, Silt, Occasional charcoal (<5%, 10mm), occasional burnt bone	Sealed by H-1104; probably lower horizon of "improved" aeolian deposit--very thin layer of [133] beneath it
0133	Layer	Friable, wind blown, Yellowish brown, Sandy silt, Very occasional charcoal	Sealed by H-1104 tephra in situ; wind blown, butting up against the structure, very thin layer over structure A2
0134	Layer	Friable, Dark brown with patches of yellowish brown, Silt, Moderate 3% charcoal fragments, rare <1% bone fragments, frequent fine roots	Truncated by Bruun´s trench in W; turf--small blocks with LNL tephra and also greyish white layer (organic?)--probably grass of turf blocks; turf collapse--surrounds structure A2

0135	Layer	Friable, Turfs in green, brown, and greyish white; base yellowish brown and patches of orange and red, smooth silt, Occasional flecks of charcoal, rare fragments of bone, frequent fine roots	Truncated by Bruun´s trench in W; cattle skull in NW, part of layer, turf--small densely deposited turfs with landnam tephra and greyish white layer (organic?); disturbed landnam tephra within the turf blocks
0136	Layer	Friable, Mixed light brown, orange, and dark brown, Silt, 1-2% charcoal flecks and max 2cm pieces, rare bits of lava stone, occasional flecks of bone	Truncated by Bruun´s trench in W; very broken up/mixed turf collapse within wall structure
0137	Layer	Friable, Mixed dark and light yellow brown, Silt, Less than 1% charcoal (5mm)	Mixed of "turf collapse"? and wind blown silt
0138	Layer	Friable, Multi-colored, dark brown/light brown, orange/gray, a little charcoal	Truncated by Bruun´s trench; lies up against northern wall of A2
0154	Layer	Friable, Yellowish brown, Silt mixed with occasional charcoal;	Windblown mixed deposit within/between turf collapse with tephra. Articulated animal (sheep or dog) lies within this context, above floor surface or within band of collapse; found in situ, placed within turf collapse or prior to collapse on floor surface
0155	Layer	Dark yellowish brown (155a) and orange red (155b) Occasional charcoal and tephra	Turf collapse, 2 types: 155a is dark brown turf, 155b is iron-rich orange-red turf; 155b is confined to the northern and southern ends of the structure while 155a is ubiquitous
0156	Structural Element	Friable, mid-brown silt with landnam tephra, with possible grassy layer	Turf, Klombruhnaus on its side --35 x 5cm, Cattle skull from this context; substantial section of turf wall, which has slipped has a whole block from the long house wall--probably
0159	Layer	Friable, Light to dark brown/bog turf increases, Silt, Less than 1-5% charcoal and small stones/bone and burnt bone fragments and large granite stones,	Truncated by Bruun´s trench; turf collapse--more bog turf present
0160	Layer	Friable, Light to dark yellowish brown, Silt	Originally interpreted as blocking between A2 and AB, now considered to be collapsed from AB
0169	Layer	Friable, Light yellowish brown, Fine sandy silt, Occasional charcoal (<1%),	Windblown silt
0170	Layer	Not excavated	Peat ash and ash layer below turf collapse mixed pinkish and whitish grey ash layer with mixed charcoal deposit inclusions as well as burnt bone--compacted surface
0171	Layer	Friable, Mid-grayish brown, heavily mottled with oranges, yellows, dark browns, and reds, Silt, Charcoal ca. 1%, small fragments (less than 5mm) frequent at 40%, and large fragments of stones 10-20cm	Weathered turf collapse, mixed in with midden material
0172	Layer	Friable, soft, Mottled, dark and light yellowish brown mixed with black charcoal, Silt with charcoal and ash, Charcoal and occasional stones,	Divided into [172a]=core area very charcoal rich and [172b]=less charcoal rich mixed with some hay; dry sieved=172B and total flot sample=172A; spread-like burnt charcoal core appears to be overlining possible wall fall
0173	Layer	Friable, Reddish and grey-brown, Silt	Turf collapse
0174	Layer	Loose to friable, Greyish brown ,Very occasional charcoal and turf fragments with frequent pale organic flecking	Hay/grass layer
0177	Layer	Friable, Mottled mid brown, Silt, Hekla 3 flecks (<10mm)--5%; charcoal <5mm--1% LNL tephra flecks (<10mm)--1%; turf flecks <10mm--5%; occasional burnt rocks	Upcast mixed with some turf collapse near base of deposit
0179	Layer	Soft, friable, Dark and light yellowish brown, Silt, 15% charcoal; minimal inclusion of hay,	Possible upcast; lies under [177] upcast and east side of building A2
0180	Layer	Friable, soft, gritty, Mottled, yellowish brown and grey, Silt, White hay (50%) and small bits of charcoal (2%)	Hay spread with some turf collapse
0181	Layer	Friable--soft (charcoal rich), Black	Charcoal spread

0183	Layer	Soft friable, Green, dark brown, yellowish brown turf, Silt	Possibly turf collapse from the hall wall; 2 areas--possibly originally 1 area (separated during excavation)
0186	Layer	Friable, soft, Light yellowish brown, Silt (slightly sandy), Hay inclusions	Possibly truncated during excavation; divided in part by a gritty hay compacted layer (same color as sandy silt)--localized in area immediately East of Skali wall overlied the sandy silt; possibly windblown deposit, truncated for turf quarrying
0187	Layer	Friable, Dominated by yellow with streaks of turf (grey, green, brown), Silt, Moderate small charcoal fragments, some bone, frequent fine roots	Possibly truncated by Bruun´s trench but does appear to be; turf collapse, compacted but possibly collapsed in one piece from wall, change in color and pattern from [160] but probably continuation of this context
0188	Layer	Friable, Mixed colors--light yellowish brown with darker browns, greens, and yellows, Silt, Charcoal less than 1%-->size 2-5mm,	Material very mixed; contains pieces of turf-->not longer than 10cm
0189	Layer	Hard, friable, Grey, green, dark brown, and medium brown, Silt, None	Turf collapse up against Skali wall; turf collapse from east wall of hall; possibly same as that in A2 ([160/188]), but if so would mean "floor" of A2 is not floor, but earlier ground surface
0190	Layer	Soft, friable, Dark, brown with patches of light brown and charcoal, Silt, Charcoal--25-30%	Charcoal rich mixed layer; layers of turf collapse and hay are also present not artifact rich; under turf wall of structure; similar to [171] contained within A2, and possibly considered the same--see [189] for consequences of this
0192	Layer	Soft, friable, not very compact--fairly loose, Yellowish brown--mottled with charcoal flecks, Gritty silt, 5-10% charcoal, Charcoal, some Hverfjall grit (5/6th c. tephra), occasional rounded stones	Layer underneath at tephra upcast--maybe from longhouse construction?; occasional round stones found concentrated toward east side of longhouse wall; trampled surface with slight aeolian/finer silt beneath; rounded stones suggest riverine source; birch twigs
0194	Layer	Soft, friable, Strong brown, Silt, High quantity of charcoal, some bone	Tephra disturbed--bits of Hekla 3; narrow layer full of charcoal, mostly about 3cm in size; two large bone pieces, a few small ones, charcoal is 5% of content
0197	Layer	Soft, friable, Light yellowish brown, Silt, Occasional charcoal inclusions	Layer up against Skali wall--just above charcoal layers--dumping of?
0199	Layer	Soft, friable, Mottled--medium yellowish brown and black, Silt--mixed with charcoal deposits, Charcoal--10%,	Again, lower deposit very similar to charcoal rich on top, but no charcoal--well, not as extensive; charcoal rich layer bounded on west by East wall of long house and on South by North wall of structure A2
0200	Layer	Friable, Lighter greyish brown with black/greenish/yellowish patches, Silt, Charcoal >1%-->ca. 2-5mm	Turf debris?
0201	Layer	Orange-red and yellowish orange, Silt, LNL tephra	Turf debris, possibly used turf dump
0202	Layer	Friable, Greyish brown with small pices of white and darker brown and more yellowish brown, Slightly gritty silt with larger particles mixed in, Charcoal >1% 1-3mm across Hekla patches	Mixed turf debris and midden
0203	Layer	Soft, friable, Mottled light yellowish brown--mottled with turf collapse, Silt, Hay inclusions--fairly patchy	Brown silt deposit appears to be mixed with turf collapse and lies just above turf collapse
0204	Layer	Friable, Light greyish/slightly yellowish brown/yellowish/greenish/darker patches-->mottled, Sandy silt, Patches of Hekla --> ca. 2-5mm	Upcast
0205	Layer	Friable, Darker greyish brown turf pieces-->yellowish/greenish patches /A180 patches of darker brown, Slightly sandy silt, Hekla 3 larger patches 5-10mm but less frequent charcoal: 3-10mm across--> >1% peat ash smaller (ca. 1cm across) patches	Mixture turf collapse/midden

0206	Layer	Dark and mottled	Trampled surface?

3.13 Area D (RE)

3.131 Structure/Space D3

In 1999 the excavation was continued in the area between the Skáli (Structure A/B) and the small structure D1 excavated 1996-1998. This area had been called D3 and had previously been partially excavated in the 1998 season. The 1998 excavation had concentrated on the removal of layers of turf collapse from the western longhouse wall and the eastern wall of D1. The 1999 excavation began with the removal of layer [083] which had been identified the previous year. Layer [083] was turf collapse and extended from the north wall of the passage [536] between the two structures but only reached to the north end of the eastern wall of D1.

Underneath layer [083] was a pinkish layer [545], very similar to that which had been recorded inside D3 in 1998, [051]. Layer [545] was very thin, compact and consisted mostly of decomposed hay but it was sampled for further analysis. It was concentrated in the southern part of D3 and its extent was confined to an area between the eastern wall of D1 and the longhouse, defined by a shallow cut [543]. This cut was made sometime after the abandonment of the Skáli AB for it cut a collapsed section of the longhouse wall [548]. What had earlier been recorded as the western longhouse wall was in fact this collapsed section of it which had preserved its construction and initially fooled the excavators.

Sealed beneath this wall section and also cut by [543] was layer [546], light brown with little charcoal and sloping up against the longhouse wall. Over this at the northern end was a layer of turf collapse [544], while beneath it and more extensive was layer [547], a greyish layer similar to that recorded elsewhere and interpreted as a sheet midden [004]. It was noted that layer [547] extended under the east wall of D1 but only reached up to the west longhouse wall and did not continue beneath it.

At the base of the sequence, reached only in the cut [543] after the removal of [545] was a sterile light brown layer [549] with the landnám tephra in situ. It was noted that the area in front of the eastern entrance into D1 was compressed and a large depression had been recorded there. This is probably because the area was trampled as people walked in and out of D1.

3.132 Area D Context Descriptions

Context	Type	Descripton	Notes
0543	Cut	Sloping between the longhouse, N, 3.5m, Sloping sides	Fill of the cut is the layer [083] (turf collapse); the cut is between the Skali wall and D1; probably not an "intentional" cut but was formed when the space between the houses was cleaned; this space, like inside of D1, was used for hay storage

0544	Layer	Soft, friable, Dark brown with flecks of reddish turf and charcoal, Silt, 2% charcoal and 1% turf debris, Tephra disturbed--Hekla 2000	Lowest part of [064/063] turf collapse
0545	Layer	Soft, friable, Light brown with patches of pink, white, and charcoal, Silt with patches of hay, 1% charcoal, 25% hay	This layer is similar to the layer that was inside D1 (hayish layer) that sealed everything within D1; it is very thin and is concentrated in the south part of D3
0546	Layer	Soft, friable, Light brown, very little bits of charcoal, Silt, Less than 1% charcoal,	Truncated by [543] cut; soil accumulation/build-up; note that this layer lies up against the longhouse wall but part of that wall has slided on top of this layer too; this layer is very much sterile and is probably accumulation of soil against the longhouse wall
0547	Layer	Friable, Grayish, black, Silt, 40% charcoal, 1% turf, "C-4" type layer;	Truncated by [543]; similar or same as C-4; it is only in the northern part of D3 because it has been cut and removed by later activity; this layer has been seen under the walls in D1
0548	Layer	Firm, friable, Light brown, greenish turf, Silt, 60% turf, 5% tephra (LNL)	Skali wall collapse; this is the longhouse wall; the wall has slid nearly intact from its original position and into D3; it is lying alongside the original longhouse wall
0549	Layer	Friable, Light brown with specks of Landnam tephra, Silt, Landn tephra	Aeolian/sterile soil just under the cultural layers
0550	Structure	Not excavated	Southern "wall" of D1
0551	Cut	Not fully exposed	Cut for structure D1

3.14 Area G (OV)

3.141 Introduction: 1996-98 excavations

The fill of a sunken feature c. 10m south of the *skáli* has been under excavation since 1996. In 1995 a re-excavation of trenches dug in 1908 and 1965 revealed that the large pit – which had previously been thought to be a rubbish-pit or a cooking-pit – was in fact a pithouse which had after its abandonment and collapse been filled with midden material from other nearby buildings (Friðriksson & Vésteinsson 1997, 1998). A hard-trodden greasy layer was uncovered at the bottom of the 1965 trench and the initial analysis of it as a floor has been confirmed by micro-morphological analysis (Simpson et al 1999). As a result of the 1995 trial excavation it was decided that a careful excavation of the midden layers infilling the pithouse would be of the utmost importance as the midden contained finely stratified lenses with extremely well preserved animal bones.

The midden deposits were excavated in the 1996, 1997 and 1998 seasons under the direction of Professor Tom McGovern (McGovern et al 1998). These excavations revealed that the midden was divided into four main phases. [0004] was the topmost layer and extended over the entire depression as well as outside it where it could be traced underneath the wall of the passage building D2. [0004] was no more than 8 cm thick at the lowest point of the dip in the centre of the sunken feature, but considerably thinner towards the edges and outside the pit. [0004] was dark grey to black silty ash, characterised by a high frequency of charcoal fragments, and some animal bone and sea-shell. [0005] was firmly below [0004], a 10-15 cm thick creamy ash deposit with thin lenses of darker ash and some pebbles ([0005b]). The [0006] series is the principal midden deposit, divided into some 17 lenses. The [0006] series is much more mixed than either [0005] or [0007] below it and seems to be the result of a series of small dumping events from a variety of sources, while both [0005] and [0007] seem to have been more homogenous in origin. [0007] was a thick deposit of peat- or turf-ash with lenses of charcoal. At the base it was mixed with [0008], turf collapse which represents the earliest phase of infilling after the abandonment of the pithouse. In 1998 the excavations stoped short

of this turf-collapse layer although some of the lenses overlying elements of [0007] had been removed ([0008c], [0008d]). It was apparent already then that the collapsing of the turf-walls associated with the house had continued for a considerable time after the depression began to be used as a refuse dump.

It was established in 1995 that the pithouse had been dug in a matter of years after the *landnám* tephra was deposited in AD 871±2 and it along with all other buildings on the site has been abandoned by 1104/58. It was clear furthermore that the pithouse must belong to the very early stage of the settlement as it had probably ceased to function and become a rubbish dump when the *skáli* was in use. A radiocarbon date of 1110±40 BP or AD 855-905 at the 1 sigma range (primary) with the calibrated intercept (mean) of AD 885 (Beta 124004), was obtained from [0006n], just above the [0007] deposit and therefore from the early phase of the midden. This suggests that the pithouse was only in use for a short time after the 870s, possibly only a decade or so and that its ruin had already begun to be infilled with midden material by the end of the 9th century.

In 1995 an uneven edge had been cut around the depression and in subsequent years this edge was maintained although it did get more even as a result of erosion from the traffic of excavators. The trench R, connecting the original area G and the *skáli* complex had been filled in in 1995 and had not been disturbed since, except further to north where it ran through area A in 1998.

During the removal of contexts [0004]-[0007] in 1996-98 care was taken not to disturb structural elements and deposits predating the midden layers. The top parts of the loose dump of earth that lines the edge of the pit ([0012]) had been revealed in parts of the area, in particular in the northern half. At 220/468 a 1x1 m square had been sunken into the side of [0012], to a depth of some 10 cm.

3.142 1999 Excavation

The 1999 excavation commenced in July 26. Area G was deturfed and extended in all directions to make a rectangular excavation area, 10 m E-W and 11,3 m N-S. At the northern edge this extended area joined with area A which had been excavated in 1998. A continuous excavation area has therefore been created from the southern part of the *skáli* to the south of the pithouse.

In area G efforts were first concentrated on removing layers outside the structure itself down to the level where excavations stopped short in 1998. By July 29 [0004] had been uncovered and was removed and dry-sieved in its entirety in the next days to August 4. At this point work commenced inside the structure and it was divided into 4 quadrants. [0008] was first removed in the SW and NE quadrants, leaving sections which were drawn and sampled for micro-morphological analysis. [0008] turned out to contain considerable amounts of midden material which was also dry sieved. The last remnants of [0008] were removed on August 19 and this left only time for careful cleaning and recording of the floor [0009] and associated features before the excavation stoped on August 21st.

3.143 Phase IV – post midden stage (c. 1000 – present)[1]

All layers more recent than the midden-fill of the pithouse had been removed in 1908 and in the current campaign of excavations these layers had only been observed in the 1m wide trench R

[1] These Phases in G are specific to the Area and not site-wide (Ed.)

dug in 1995. In the trench only the faintest traces of human activity could be found in the largely windblown natural accumulation above the pithouse and associated midden diposits. Within this natural accumulation, [0016], a number of tephra horizons could be identified. H-1104/58 could be detected in patches 3-4 cm above the cultural layers and above it were H-1300, V-1477 and V-1717. The V-1477 tephra is particularly thick and easily identifiable (Sigurgeirsson 1998).

In the part of G which was extended in 1999, [0016] was in all major respects the same as in trench R. Just below the grassroots there were patches of 1-2 cm thick midden lenses of a type which has been observed widely in the excavation area. Some of these lenses post-date the 1908 excavation whereas others may be slightly earlier, but judging from their situation vis-à-vis the V-1717 tephra they can not be much earlier then the mid-19th century. These lenses have been interpreted as attempts to improve the hay-fields around the modern farmstead, by spreading its middens – a practice witnessed by the present farmers in their youth (1930s).

Between these lenses and V-1477 [0016] is very homogenous and only the faintest traces of human presence can be detected (ash and charcoal). Below V-1477 there were larger concentrations of charcoal and one of these formed a discrete patch at the southern edge of the excavation area, [0700]. This patch was about 1 m across and 9 cm thick. It was quite compacted, with some animal bone in addition to the charcoal. Similar material was observed in [0016], just below V-1477, south and east of the pit. Further down H-1104/58 could be observed more or less continuously in the edge of the excavation but was very faint closer to the pit. Around this tephra [0016] was quite homogenous, made up entirely of windblown material, with no identifiabal traces of human presence. Two pieces of pottery were recovered from the upper part of [0016] – <99-358> and <99-359>.

After the cessation of the use of the pit as a midden deposit sometime well before 1104/58 it seems therefore that human activity in the area ceased completely. Some activity, probably related to field-improvement, can be detected shortly before 1477 and again in the late 19th and early 20th centuries.

3.144 Phase III – midden stage (10th century)

This phase has already been described in earlier reports (McGovern et al. 1996, 1997; McGovern 1998) as regards the midden itself inside the oval depression. In 1999 it was observed only as the sheet midden [0004] which represents the last stage of the midden formation outside the pithouse and as lenses embedded in [0008] which represent the earliest stage of the midden inside the structure.

[0004] is thickest on top of the wall foundation [0012], on the edge of the pithouse but peters out rapidly to all sides, going from 3-5 cm closest to the edge to 0,1-2 cm at the edge of the excavation. On the north side of the pithouse, [0004] is most substantial, in excess of 5 cm. There it is whiteish grey and quite mixed with flecks of charcoal, ash, some burnt bones and small pebbles. 1,5 m north of the pithouse edge the layer turns more homogenous grey-brown with occasional charcoal and ash. In this form it is widespread and could be traced widely in area A in 1998 where it was recorded as [0106]. The sheet midden dips down from the wall-foundations [0012] on the edge of the pithouse following the angle of [0012] but outside its rim it is flat except in the northeastern corner of the excavation area where it slopes upward towards structure A3.

On the eastern and southeastern edge of the pithouse (on top of [0012]), confined to an area inside 1m from the edge of the pithouse, [0004] could be divided into lenses. At the base there

was a 0,5-1,5 cm thick lens of water worn pebbles (0,1-1 cm) mixed with small fragments of sea-shell and substantial chunks of charcoal. On top of this with an even more limited distribution was a lens of whiteish grey ash with small fragments of charcoal. On top of this the layer was a more mixed blend of soil, ash and charcoal. In this area (1 m from the edge on the eastern side) there were frequent large pieces of unburnt animal bone, mainly domestic mammals but elsewhere only small fragments of burnt bone was found in [0004]. All the small finds recovered from [0004] were found in the area east of the pithouse edge, among them two iron nails (<99-87> and <99-88>), a whole blue glass bead (<99-396>) and half a bead of clear glass with a yellow tint and with a blue glass inlay (<99-397>). Occasional small pieces of slag were found widely in [0004] (<99-251>).

The lower lenses of [0004] on the eastern edge of the pithouse are more reminiscent of [0007] and the midden component embedded in [0008] than the rest of [0004] and it may be – as observed in 1995 – that parts of [0004] closest to the pithouse are intermixed with earlier layers, probably due to trampling on the edge of the depression where the refuse was dumped. In particular it seems that [0007] has spilled on the outside, especially to the east of the pithouse, but little or no traces of [0005] or [0006] related material were observed there. It seems therefore that the eastern pithouse wall was already completely collapsed when the pithouse ruin began to be used as a rubbish dump.

Excavation of the turf-collapse [0008] inside the structure showed however that dumping of refuse had begun while the turf walls were still deteriorating. In the northeastern half of the building [0008] was heavily mixed with midden material, primarily 1-3 cm thick lenses of white-grey ash with sand, small pebbles, soggy chunks of charcoal and mostly very small fragments of animal bone and sea shell. Some of this midden material was resting directly on the floor, [0009], but mostly it was separated by 2-6 cm of turf remains, but otherwise widely distributed in the turf collapse layer [0008]. [0008] was upto 0,8 m thick at the sides of the structure but tapered out at a 30°-40° angle to become only 10 cm thick in the centre of the building. In the northwestern corner there was a large (2,1x0,95 m) continuous lens of charcoal with a high frequency of fish bone ([0008f]). This lens was some 60 cm above the floor and therefore belongs to the latter stages of the collapsing phase. It is more akin to lenses in the [0007] and [0006] series than the other midden deposits embedded in [0008]. It suggests that the different midden deposits come from different activity areas and that the activities represented by different midden deposits were taking place all the while the pithouse was getting infilled by turf collapse and midden material. In other words the differences in midden deposits may not reflect actual change in householding or other economic practices but rather changes in dumping patterns.

The bulk of [0008], the turf collapse, was made up of yellow-brown silt with specks of the H3 tephra which is the same sort of material as in [0012] still on the edges of the pithouse, and of blocks of turf, dark-grey with bluish-green stripes and the *landnám* tephra. These blocks are *klömbruhnaus* of the same sort as in the walls of the *skáli*. The type of turf suggests that the collapse is primarily wall material and not from a turf roof. In the southwestern half of the building [0008] was dominated by these turf-blocks with no traces of the midden material. In the southwestern corner the blocks were particularly big, representing whole sections of the wall which have tumbled down into the pithouse. The size of these blocks may suggest that parts of the walls were collapsed intentionally. The largest blocks are primarily found towards the bottom of the layer suggesting that the larger part of the structural elements on the edge of the pit had collapsed into the pit before dumping of refuse commenced but that gradual collapsing and erosion of turf and earth from the edges contined for a long time after dumping had begun. In three places alongside the pithouse edge cavities were found in [0008] and these

turned out to be in continuation of postholes dug into the pithouse floor ([0701], [0702] and [0705]). This suggests that at least some structural timbers were still intact when the turf-blocks began to collapse.

The distribution of the midden material embedded in [0008] as well as the more mixed nature of [0004] on the eastern edge of the pithouse suggests that the dumping took place from the east or southeast. This was also indicated by the bedding angles of the midden layers [0007], [0006] and [0005].

At the base of [0008] there was a thin layer separating it from the floor [0009]. This was only a thin (<0,5 cm) veneer of soft, greasy grey silt which may represent a period of disuse before the building began to collapse.

A few objects were retreived from [0008], pieces of iron (<99-91>, <99-92>) and bronze (<99-93>), slag (<99-252>, <99-253>) and a whetstone (<99-268>) from the midden dominated upper parts of the layer in the northeastern corner of the building. Towards the bottom of the layer, in the turf dominated parts, 3 loomweights were retrieved (<99-266>, <99-267>, <99-269>), a whole steatite spindlewhorl, broken in two (<99-263>) and half a steatite spindlewhorl (<99-264>). It is possible that the spindlewhorls and loomweights were among the debris left in the building when it was abandoned and came mixed with the first chunks of collapsing turf.

3.145 Phase II – pit house (c. 870s- c. 900)

In 1999 the excavation stoped short of the floor layer so a final report will not be available on the pithouse until after the 2000 season when it is planned to complete the excavation of the floor.

After [0008] had been removed a floorspace of 5x3,4 m was revealed. The building is not entirely rectangular, the corners are rounded and the sides tuck in towards the ends, so that the southern side is 3 m long and the northern 3,2 m, the eastern side is 4,8 m and the western 4,75 m. The sides are cut ([0011]) through a series of prehistoric tephra layers, the LNS, Hverfjall tephra from ca. 700 BC and H3 from c. 900 BC and H4 from c. 2500 BC. The ground from which the pit was dug was uneven, in the southeastern corner the original surface was 110 cm above the floor and 85-100 cm in the northwestern corner where there seem to have been hummocks. At the eastern side and the northwestern corner parts of the topsoil had been removed to a depth of 10-15 cm prior to the construction of the pithouse and there cultural layers were 71-92 cm above the floor. The pithouse was therefore dug down to a depth of 1m. Where topsoil had been removed prior to the construction of the pithouse turf ([0010]) was stacked to fill the gap. This turf is darkbrown with grey-green stripes, of a similar – but not the same – type as the turf found in the collapse [0008] and in the *skáli* walls. It was nowhere more than 16 cm thick. On top of it was a pile of upcast from the pit, fine yellow-brown silt with abundant flecks of the distinctive H3 tephra, [0012]. This pile was 20-30 cm thick on the edges where it formed a 50 cm wide bank lining the whole pit. The material spread out from the bank in a thin lens ending nowhere more then 1,5 m from the pithouse edge.

Above this upcast layer was a 2-8 cm thick layer of natural accumulation, homogenous yellow-brown silt, [0013], which has accumulated between the building of the pithouse and the deposition of the [0004] sheet midden. When this was removed no traces of the removal of the topsoil as observed in the sides of the pithouse could be detected outside the spread of [0012]. This may suggest that the removal of the topsoil was somehow connected to the construction of the pithouse. The constructors may have changed their minds as to the aligment or size of

the house after the digging had commenced, or the sill filled with stacked turf may have been intentional, possibly as a means of strengthening the sides. How far this sill extends from the pithouse side is not known as [0012] has not been removed. It is not apparent that this sill is connected to the fact that the pithouse is built on a very slight incline. The surface from which it was dug is some 20 cm lower west of the building than east of it – a diffference hardly likely to make much difference on a ground which was uneven to a degree of 25 cm on account of frost heaving. The sheet midden [0004] rested directly on top of the upcast pile [0012] and there where nowhere traces of turf on the edges – or further out for that matter – except for the blocks underneath [0012]. This is somewhat surprising considering the amount of turf found inside the structure arranged in a manner which must indicate that it was originally stacked on the edge of the pit. An explanation of this could be that there was originally a turf wall built on top of the upcast pile, but that it was not very wide (hardly more than 50-60 cm) and that it and parts of the upcast pile underneath it were collapsed and shovelled into the pit well before the walls had begun to deteriorate to any degree. If they had it would be expected that turf debris was found on the outside of the pithouse-wall perimeter. This sort of intentional collapsing was probaly occasioned by the pit becoming a danger for children and animals after it became derelict. Against this it could be pointed out that the midden material embedded within [0008] in the northeastern half of the pit suggests the opposite: gradual deterioration while refuse was being dumped into the pit. A possible solution is that the midden material embedded in [0008] (apart from [0008f]) was shovelled in with the wall remains, either because it formed piles abutting the wall or was a part of it like the southern wall of D1.

The sides of the cut ([0011]) are remarkably straight, especially towards the bottom, whereas 20-60 cm above the floor they bulge out in places as much as 15 cm. Only in one place in the northern side was there a pitting into the side (ca. 20 cm in diam, 15 cm deep) which could possibly be traced to the time when the house was occupied, although it may well have been made when the house was under construction or after it was abandoned. The lack of pitting may possibly be taken as evidence that the house was panelled on the inside.

Alongside the pithouse sides there is a row of postholes. In all 19 have been revealed, but more are likely to come to light – especially by the western side – when the floor layers will be examined. In 1999 5 postholes were revealed by the southern side, one in the very southeast corner, 8 by the eastern side counting two very slight depressions as postholes, 7 by the northern side – one of them only a very slight depression – and only two by the western side. The postholes range in depth from 5 to 22 cm, most between 7 and 14 cm. Most are rectangular or sub-rectangular and most are in the same size range, 15-20 cm wide. They are not evenly spaced, but typically there are 40-60 cm between them. There is some evidence that the postholes are not all coterminous. [0708] and [0709] on the one hand and [0712] and [0713] on the other are so closely spaced that it is more likely that one of each pair is the remains of a resetting of the post. One of these, [0708], was partly covered by the floor [0009], suggesting that it is earlier than its neighbour [0709]. Evidence of resetting comes also from [0730] and [0732] where smaller posts have been sunk into an earlier, wider posthole.

The postholes are aligned in straight rows quite close to the sides of the pithouse. Only at the eastern sides is there a gap of some 10 cm between the postholes and the side. In places the floor, [0009], extends to the inner edges of the postholes but mostly they are not directly associated with the floorlayer. Instead there is a belt corresponding to the width of the postholes running around the whole building which in places is slightly lower, 2-3 cm, than the surface of the floor, [0009]. By most of the eastern side and the eastern half of the northern side there is a massive iron pan marking the inner surface of the pithouse. This iron pan coats

the insides of the postholes in this area but west of the postholes it gets much thinner and is partly covered by the floor [0009b]. There is also a suggestion of an iron pan in the southwestern quarter where the floor, [0009b], is very thin.

The floor proper, [0009a], is pitchblack with a blueish hue, quite hard and greasy, made up of soot and ground charcoal. Along the centre of the pithouse and in its northwestern corner it is 1-2 cm thick, but to the sides (i.e. eastern side and southwestern quarter) it does not cover the subsoil, [0003], completely and is really only an iron pan with very thin patches of the black floor material and some more colourful (creamy-yellow-green) patches of what seem to be organic remains. These are however nowhere more than 1 cm thick and mostly this part of the floor, [0009b], is only 0,2-0,5 cm thick in addition to the iron pan.

The floor is very even, with height differences amounting to only 3 cm at the most. The exception from this is in the northwestern corner where the floor rises abruptly by 8 to 10 cm to be cut away in an area 1,2x0,9 m in size. In the area left by the cut, [0704], there was a loose pile of small stones, many of them cracked by fire, mixed with yellow-brown, rather gritty soil not much different from the soil in [0008]. On the southern side of the cut there is a double row of small stones which seems to be *in situ*, but the rest have all been disturbed and the surface below this context, [0703], is very uneven. It seems that these are the remains of a robbed-out fireplace. The fire cracked rocks, the sloping of the floor up towards this area – the only one of the four corners where the floor proper is found at all – and the row of stones – the only such on the whole surface of the pithouse – strongly suggest that a substantial fire place was in this corner of the building. It was probably removed after the final abandonment of the structure as no traces of a surface layer were found on top of the rubble left. In fact there was no clear border between [0008] and [0703]. The removal of the fireplace seems to have involved some excavation as a part of the floor had to be removed in order to extract what must be considered to have been large stones, making up the fireplace. They must have been large slabs – not common in the vicinity of Hofstaðir – or special stones in some way to make them valuable enough to be removed when the building was abandoned.

Around the fireplace there were 7 small stakeholes with cavities 4-23 cm deep. They are the only such holes in the floor of the pithouse as yet observed and their concentration around the fireplace suggests that they had something to do with it or activities associated with it. Apart from the robbed-out fireplace and stakeholes associated with it there are few features in the floor. Towards the middle of the eastern side there is a single flat slab resting on the floor and three slight depressions north of it and a single, more marked depression ([0736]) some 60 cm south of it.

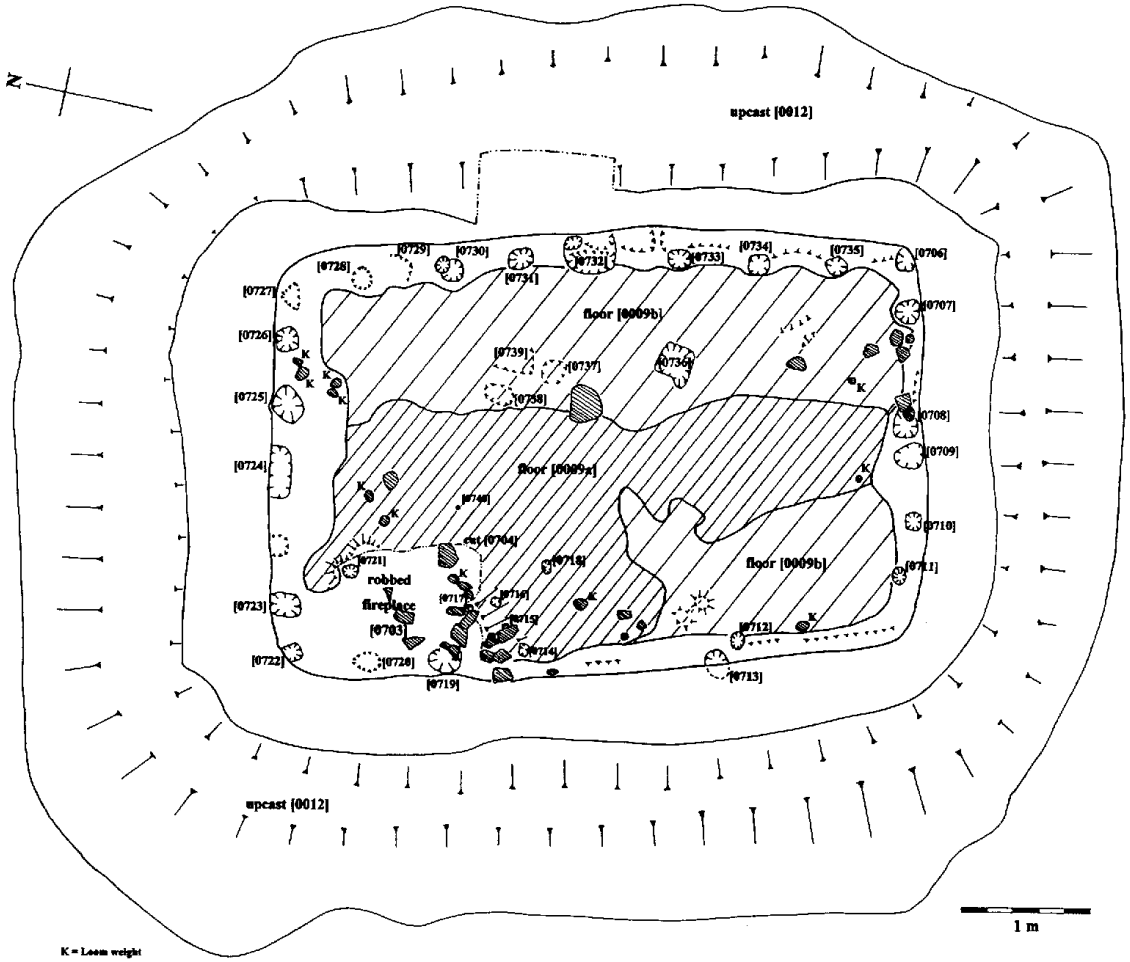


Figure 3.4 Pit House in Area G

These are the only features which might possibly be linked to a stairway or some other structure marking an entrance to the building. As already noted there is a continuous pile of upcast around the perimeter of the pithouse and nowhere is there any indication of an entrance on the edge. Judging from the distribution of midden material in [0008] and bedding angles of the later midden deposits it seems that rubbish was dumped mainly from the east or southeast. If the turf walls had been collapsed into the pit before dumping began in earnest this cannot be taken as an indicator of the location of the entrance. It would however fit the location of the flat slab and depressions in the eastern part of the building if the entrance was on the middle of the eastern wall. The slab and depressions are however in excess of 1 m from the side and may therefore have nothing to do with any entrance.

No objects have as yet been retreived from the floor but cleaning revealed a high density of animal bone. 12 loomweights were lying on the floor, four of them in pairs of two by the northern side. Along with the loomweights and spindlewhorls retreived from the base of [0008], these are the only indications as yet obtained on the function of this building. Weaving and textile making implements are commonly found in pithouses in Iceland and the Hofstaðir pithouse seems to be no exception.

3.146 Phase I – pre pithouse (870s)

The removal of topsoil prior to the construction of the pithouse has been discussed already and the possibility that this had something to do with the construction as the excavation seems to be limited to the perimeter of the pithouse. It is therefore not conclusive evidence for an occupation of the site prior to the construction of the pithouse. Associated with this cut there is a layer [0014], which shows that some excavations had taken place in the vicinity of the pithouse prior to its construction. In trench R this layer had been observed above [0017], a slightly disturbed layer on top of the *landnám* tephra. [0014] can be traced 3,5 m to the north in trench R and can be seen in the whole length of the northern side of the pithouse, and 2,2 m to the south along the east side. This layer extends therefore at least 5,7 m from north to south and 3,3 m east to west. It is thickest at the northern side of the pithouse, upto 1,5 cm, but thins out to become 0,2 cm thick in the middle of the eastern side and similarly in the trench R. [0014] is made up of yellow brown silt with flecks of H3, similar to [0012] but slightly darker. It is therefore upcast from some excavation which has penetrated deep enough to disturb the H3 tephra. This layer is under the turf [0010] in the cut where the topsoil had been removed in the eastern side of the pithouse. It could be argued that if the cut is associated with the pit-house, [0014], must also be associated with it somehow. It is however strange that a removal of top soil in preparation for the digging of a pithouse should be followed by an at least 40 cm deep excavation, the upcast from which was then spread over a large area before the cut was made for the pithouse. It seems more likely that the excavation predated the removal of the top soil in preparation for the digging out of the pithouse and that the upcast pile was levelled out when the pithouse was built.

A single object has been retreived from [0014], a wedge shaped nail, 3,75 cm long with a 0,9x0,25 cm head (<99-94>) which, if found in a later deposit would be classified as a horseshoe-nail.

3.147 Conclusions

An unusually large pithouse has now been excavated at Hofstaðir. The floorlayers remain to be examined but the principal features of the house have been revealed. It is 17 m^2, only slightly smaller than the pithouse at Gjáskógar (17,98 m^2) (Eldjárn 1961) but larger than all others hitherto excavated in Iceland which are all, except the Gjáskógar and Hjálmsstaðir

(14,31 m^2) pithouses, smaller than $10m^2$ (Vésteinsson 1991). It has however much in common with the other houses. The floor is thin, there was a substantial fireplace in one corner and the small finds are dominated by textile making implements. The pile of upcast on the pithouse edge and the turf wall which seems to have stood on it are however unusual features – only at Granastaðir has a turf wall been found in association with a pithouse, and there it was lining the insides of the pit, not on its edge. This sort of comparison is however difficult as in many cases the original surface has been removed or was not investigated in the excavations in question. Only the pithouses at Hvítarholt I, IV and VII have similar post settings but in those buildings the postholes are much less substantial than in the Hofstaðir pit-house. As with all the other pithouses no evidence for roofing was found. The turf found inside the structure was not roofing-turf and the roof may therefore have been made of timber. It is also quite possible that the insides of the house were panelled although no direct evidence was found for this. Although the limited thickness of the floor suggests a short time span of occupation some evidence has been found of resetting of posts, indicating that the building was in use long enough to need repairs.

Although analysis of the floorlayers has yet to be completed it seems that this building was originally built as a temporary dwelling, a function it may have served only for a short time, possibly only a year or two. The total time span of occupation may have been somewhat longer – the house may have been used as work space, possibly a weaving shop for a number of years before it was abandoned. This cannot have been long however, judging from the thickness of the floor and the radiocarbon date from the later midden layers. When the house was abandoned its fire place was removed and while it may have stood empty for some time after this the turfwalls were soon collapsed and shovelled into the pit, which afterwards was used as a rubbish dump for a long time.

3.148 Area G Context Descriptions

Context	Type	Description	Notes
0700	Layer	Flaky, soft, Dark brown with black and red flecks, Silty clay, Contains pieces of burnt charcoal (5%)/ bone fragments,	A tephra 1477 lies directly above [700]; H1104 visible directly underneath; bone fragments of which make up a very small percentage; in the south wall above the A tephra and [700] is a patch of rocks, some burnt, about 30cm wide
0701	Cut	Sub-rectangular, Round, 11x 9cm--34cm deep, Straight--vertical	Cut and cast for post in SW quadrant; observed as a cavity in [008]--the remains of a post which must have been left standing when the pit house collapsed and [008] formed inside it
0702	Fill	Void	1.1m north from the south side and 20cm west from the eastern side there was a cavity in [008] continuing through and below [009]; the cavity seems to be at an angle, the upper end being some 10cm further SSW than the bottom; interpreted as a cavity left by a post
0703	Layer	Loose, friable, Yellow brown, Gritty silt, Charcoal (1%), ash (0.5%)	In the NW quadrant the floor [009] rises towards an irregular heap of stones set in similar material as [008] but much less mixed and only with traces of charcoal and ash which are more likely to stem from [008] rather than [009] or the fireplace itself
0704	Cut	L-shape in plan, 1.20m N-S, 0.9m E-W	Cut for robbing of fireplace
0705	Fill		Fill (cavity) of posthole by E-side; 19cm deep--extends 4cm up into [008]
0706	Cut		Cut for post hole--filled by [0008]
0707	Cut		Cut for post hole--filled by [0008]

0708	Cut	Cut for post hole--filled by [0008]
0709	Cut	Cut for post hole--filled by [0008]
0710	Cut	Cut for post hole--filled by [701]
0711	Cut	Cut for post hole--filled by [0008]
0712	Cut	Cut for post hole--filled by [0008]
0713	Cut	Cut for post hole--filled by [0008]
0714	Cut	Cut for hole--filled by cavity (10cm deep)
0715	Cut	Cut for hole--filled by cavity (4cm deep at 30° angle)
0716	Cut	Cut for hole--filled by cavity (23cm deep)
0717	Cut	Cut for hole--filled by cavity (8cm deep)
0718	Cut	Cut for hole--filled by cavity
0719	Cut	Cut for post hole--filled by [703]
0720	Cut	Cut for shallow post hole--filled by [703]
0721	Cut	Cut for hole--filled by cavity
0722	Cut	Cut for post hole--filled by [0008]
0723	Cut	Cut for post hole--filled by [0008]
0724	Cut	Cut for post(?) hole--filled by [0008]
0725	Cut	Cut for post hole--filled by [0008]
0726	Cut	Cut for post hole--filled by [0008]
0727	Cut	Cut for post hole--filled by [0008]
0728	Cut	Cut for shallow post hole--filled by [0008]
0729	Cut	Cut for post hole--filled by [0008]
0730	Cut	Cut for post hole--filled by [705]
0731	Cut	Cut for post hole--filled by [0008]
0732	Cut	Cut for post hole--filled by [0008]
0733	Cut	Cut for post hole--filled by [0008]
0734	Cut	Cut for post hole--filled [702]
0735	Cut	Cut for post hole--filled by [0008]
0736	Cut	Cut for shallow pit--filled by [0008]
0737	Cut	Cut for shallow pit--filled by [0008]
0738	Cut	Cut for shallow pit--filled by [0008]
0739	Cut	Cut for shallow pit--filled by [0008]
0740	Cut	Cut for hole--filled by cavity; 10cm deep; nearly vertical; 30° angle

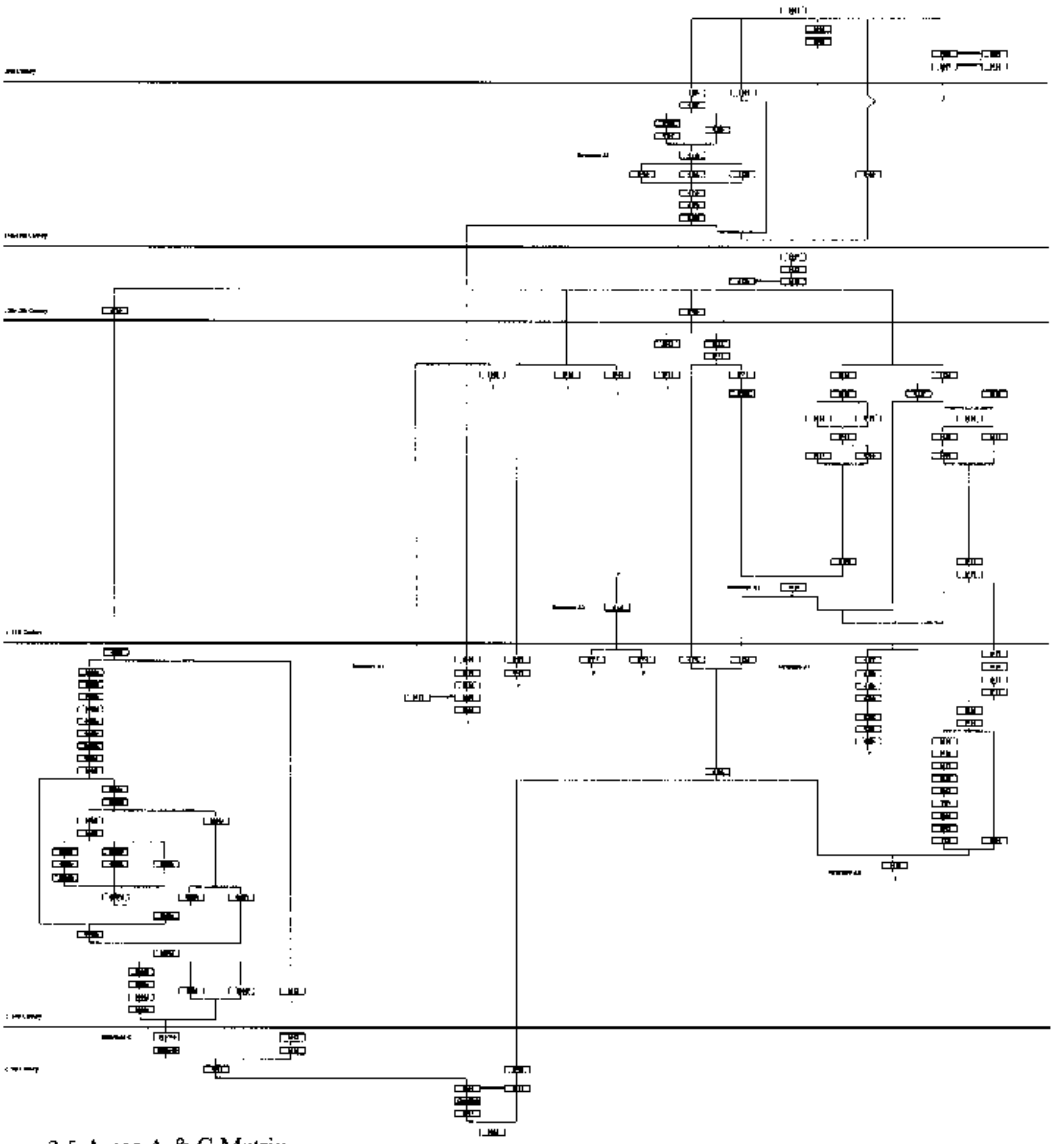


Figure 3.5 Areas A & G Matrix

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3.2 THE MEDIEVAL CHURCHYARD (H. GESTSDÓTTIR)

3.21 Introduction

The focus of the archaeological investigations at Hofstaðir was extended with the opening of Area Z 80m south-west of the skáli excavation. Area Z was 10m wide (north-south) and 12.3m long (east-west) at the southern edge, stepping in twice to a length of 9m on the northern side. In addition a metre wide trench, Z(t), was cut from the north-eastern corner of Area Z extending 12.9m to the east.

The primary aim of the investigation was to locate the chapel and cemetery at Hofstaðir. There are two historical references to a church or chapel on the Hofstaðir farm. The first is a deed of property transfer dating to the 12th of April 1477 concerning the sale of Hofstaðir and several other farms. According to the deed, the owner of the Hofstaðir was to uphold a chapel situated on the farm, suggesting that at the time of the writing there was or had at one time been a chapel at Hofstaðir.

J sama handabandi selldi tittnefndr jon þorkelsson opt nefndum finboga jonssyni jordina hofstadi er liggur j reykiahlidar kirk(i)usokn vid myvatn... Item skyllde finboge suara kirk(i)v skylld oc benhvs skylld aa þveræ oc hofstodum.

?In the same handshake the aforementioned jon þorkelsson sold the aforementioned finbogi jónsson the farm hofstaðir which lies in the parish of reykjahlid by myvatn... Also finbogi should uphold the church and chapel of þveræ and hofstaðir]

-Íslenzkt fornbréfasafn VI 1904, 110 – transl. H.Gestsdóttir

The second piece of evidence concerning the chapel at Hofstaðir is the place name *Kirkjugarður [Churchyard]* in the field east of the farm mound. The current owners of Hofstaðir remember a circular enclosure in that part of the field, which they levelled three decades ago to make the land available for cultivation.

Bogadreginn garður sást lengi austan við bæjarhólinn. Kom hann undan bæjarhúsunum og lá í sveig austur fyrir smiðjuna og undir öskuhauginn norðan við hana... Garðurinn mun hafa verið 20-30 m í þvermál og var greinilega hringlaga þó hann sæist ekki allur... Garðurinn var kallaður “Kirkjugarður”. Hann var sléttaður eftir miðja öldina.

[A curved bank was visible east of the farm mound. It lay from the farm buildings curving to the east of the smithy and under the midden north of it... The bank was about 20-30m in diameter and was quite clearly circular, although not all of it was visible... The bank was known as “Churchwall”. It was levelled sometime after the middle of the century.]

-Vésteinsson 1996, 86 – transl. H.Gestsdóttir

Prior to excavation a geophysical survey was carried out over the area in an attempt to locate the church remains. The earth resistance survey located a near rectilinear high resistance anomaly, approximately 6x4m and orientated east-west, on the eastern edge of the farm mound. Although it was not possible to identify this anomaly as structural remains based on the geophysical survey, it was situated in the centre of a circular (30m diameter) low resistance anomaly, possibly an infilled boundary ditch. (Horsley, 1999), which is consistent with a medieval Icelandic church (for more detail on the geophysical survey see Chapter 2). Area Z was opened to investigate the anomaly in the centre of the circular enclosure, and trench Z(t) to locate the grave cuts and the circular enclosure identified in the geophysical survey. The same excavation techniques were used as in previous years at Hofstaðir, the turf and top soil were removed by hand, and the archaeological remains excavated using single context

planning. The matrix for the excavated contexts is shown in Figure 3.8, and the description of the numbered contexts in section 3.224.

3.22 Area Z

There are three main features identified in the 1999 excavation of Area Z. These are the structure Z1, the truncation in the eastern end of trench Z(t) and the graves. The excavated units have been divided into three preliminary phases which are only applicable to Area Z.

3.221 Phase III (18th-20th century)

The latest phase in Area Z had been greatly disturbed by the levelling of the land in the middle of the 20th century. This is marked by a truncation [1501] 6.13m wide and 15cm deep which runs north – south across the eastern end of Area Z, and the western end of trench Z(t), and is clearly visible on the surface extending both to the north and the south of the excavation area, following the eastern limit of the farm mound and curving around it to the west. The truncation was filled with turf and topsoil and probably represents a bulldozer track. The levelling of the area has also caused a great disturbance in the topmost layers to the west of the truncation [1501], representing the eastern edge of the farm mound. Phase III consists mainly of turf debris layers [1500, 1502, 1503 & 1514] separated by thin lenses of charcoal, ash and animal bone [1505 & 1513] probably representing debris associated with the farm site which lies directly to the west of the area. Finds from these contexts date them to no earlier than the 18th century, for example post-medieval/early modern pottery and glass sherds, and clay pipe fragments (for more detail see the finds report, Chapter 9).

3.222 Phase II (post 1477)

Phase II consists of debris from structure Z1. Structure Z1, which has only been partially excavated, is severely damaged by the levelling of the area. The excavated contexts are mainly turf collapse or turf debris [1517, 1525, 1531 & 1537] all of which contain the V-1477 tephra within the turf and all of which are associated with structure Z1. These contexts all lay between or south of the two rows of stone [1547 & 1548] shown in Figure 3.6 and represent mainly collapse or debris from the southern wall of the structure. As yet unexcavated are several turf collapse and debris layers [1540, 1541, 1542, 1543 & 1544] associated with this structure. These are all concentrated around the stone structures [1547 & 1548] and all of them also have the disturbed V-1477 tephra in the turf. All that remains structurally of structure Z1 are the stone wall foundations [1546, 1547 & 1548] shown in Figure 3.6. Contexts [1547] & [1548] lie parallel to each other, and seem to represent the remains of an inner and outer stone lining of the southern wall of the structure. Context [1546] may represent the eastern end of the northern wall of the same structure. As yet there is no *in situ* turf associated with structure Z1 visible, and it is quite clear that there are no remains of turf on the northern side, as the western, north-western and eastern parts of the structure have been completely destroyed by the machining, although it is possible that the eastern end was open, a theory that is supported by the north – south orientation of the eastern end of stone structures [1546] & [1547]. East of structure Z1 are several large rocks, some of which were visible on the surface prior to deturfing, which may have been part of the structure, but were disturbed as a result of the levelling of the area.

Between the stone rows [1546] and [1547] was an area approximately 3,2m east – west, truncated on the western end by a modern cut [1526] filled by thin, fairly mixed organic layers

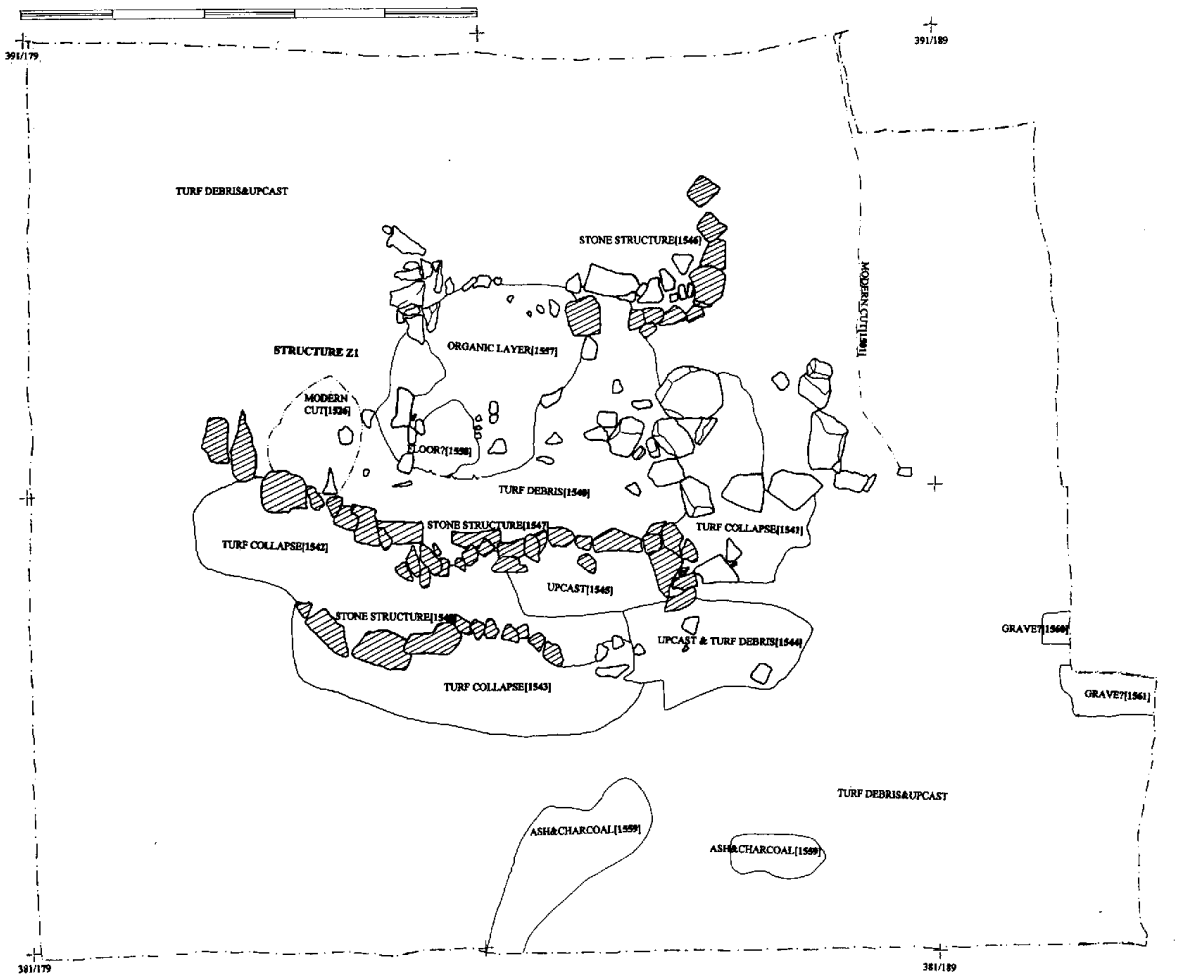

Figure 3.6 Structure Z1

[1529, 1533 & 1538]. They probably mark the inside of structure Z1, although they are not trampled and therefore not floor layers. It is known that in the first part of the 20th century the area was used to store dung, although it is not known for how long it was used as such, and it is quite possible that these organic layers represents such a use.

Structure Z1 is a stone and turf structure, its outer dimensions approximately 6,5x5,5m orientated east – west, possibly with an entrance facing east. Although these building remains are too damaged and insubstantial to allow a definite identification of the structure, it's location and layout are entirely consistent with that of a small church. The possibility remains however that the structure revealed in 1999 is a farm building of some sort associated with the farm mound, built on the site of the church after it fell into disuse.

3.223 Phase I (pre 1477?)

Phase I includes the graveyard and is chiefly located in Area Z(t). Most of the excavated contexts in the area were windblown layers with some turf and/or charcoal content [1504, 1506, 1507, 1509, 1510, 1515, 1516, 1524]. In the eastern end of the trench Z(t) the western edge of a truncation [1555], which appears to be running north – south was exposed. The western edge of the cut, which is approximately 40cm deep, is stepped and it was filled with a very homogenous windblown loess with charcoal fragments and white tephra [1524]. Approximately 40cm west of truncation [1555] are two shallow and narrow (5x18cm) cuts [1563] & [1564] running parallel to each other (and trench [1555]?). Both these were filled with homogenous windblown loess [1527] & [1562]. All the truncations are sealed by both V-1477 and H-1300 tephra, the latter overlays a 6cm thick windblown layer [1506] which overlays the fill of the trench [1524]. Whether the trench represents the circular low resistance anomaly (churchyard), or less intense high resistance anomaly (see Chapter 2) is as yet uncertain, and will be investigated further next year.

In the western end of the trench Z(t) there was an extensive upcast layer [1511] which sealed the grave cuts. This context [1511] was exposed as the base of the modern cut [1501], which truncated both the V-1477 and the landnám tephra layers, so at the present it is not possible to comment on the date of the graves. A total of six graves were exposed in the western end of trench Z(t). All of the graves are orientated east – west, and all of them respect each other, although there is a slight overlap in some cases. The graves appear to be laid out in two organised rows running north – south (see Figure 3.7). There do not seem to be any graves extending further east than the eastern line of graves exposed in trench Z(t). In addition two possible graves were located in the eastern end of Area Z [1560] & [1561] (see Figure 3.6). As the area has not been fully excavated it is unclear whether they are the remains of grave cuts.

One of the graves [1532] was excavated to examine the state of preservation of the bones, in order to assess if the skeletal material at Hofstaðir is suitable for osteo-archaeological research. The skeleton was lying supine in the grave, both hands rested on the pelvis, although the right arm was bent at the elbow while the left arm was straight, parallel to the body, and bent at the wrist. The legs were extended straight, with the right foot resting on the left foot. The edges of the grave cut were vertical with a flat base, and there were no wooden coffin remains or traces of any organic material which could be the remains of a shroud or some sort of wrapping. There was however a thin layer of very fine ash covering the thoracic region of the skeleton. The preservation of the skeletal remains was very good, and therefore next year there will be a more extensive excavation of the graves at Hofstaðir.

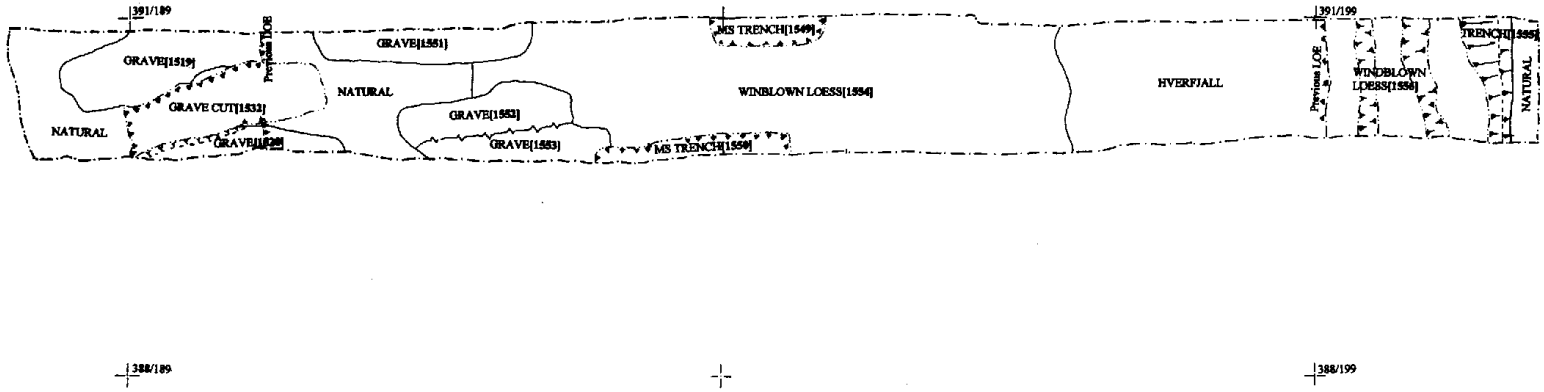

Figure 3.7 Trench Zt

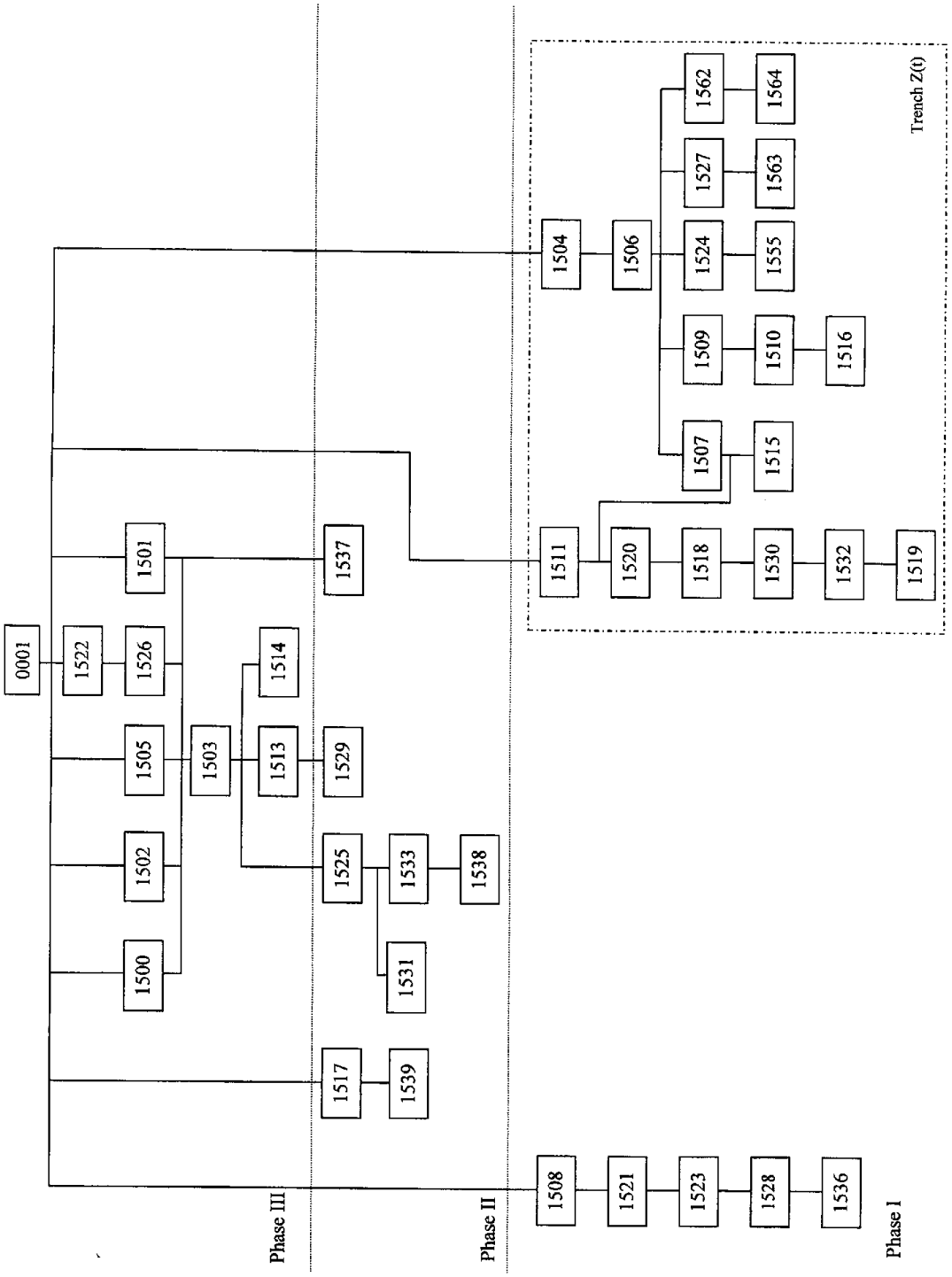

Figure 3.8 Area Z Matrix

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3.224 Area Z Context Descriptions

Context	Type	Description	Notes
1500	Layer	Firm, friable, Mottled,purpleish brown with orange fleck, Silt/turf debris, Small felcks of charcoal	Turf debris layer, probably associated with the farm mound
1501	Cut	Rectangular, 0,15m deep / 10x5m, Vertical/stepped in northwestern corner,	Modern cut? Possibly made by bulldozer when the field and farm mound were levelled. Filled with the turf and topsoil.
1502	Layer	Soft, Reddish-brown mottled, Silt, turf debris, Charcoal	Turf debris, possibly associated with farm mound.
1503	Layer	Firm, friable, Very mottled, mainly dark reddish brown, Silt, turf fragments, Small fragments of charcoal	Turf debris, probably associated with farm mound, 18-19th century??
1504	Layer	Friable, Light brown, mottled, Silt, Fragments of dark tephra (2%), charcoal (2%), Slightly disturbed natural soil	Slightly disturbed natural soil
1505	Layer	Loose, Grey, Ash, Charcoal	Lens of ash midden-like deposit
1506	Layer	Soft, Mottled orangeish brown, Silt, Pebbles (2%), charcoal (<1%)	Mostly natural wind deposited layer
1507	Layer	Slightly soft, Mottled orangeish brown, Silt, Fragments of tephra (1104/H3?), turf fragments	Turf debris
1508	Layer	Soft, Mottled dark brown, Clay-silt, Angular stones	Turf debris, possibly associated with early farm mound?
1509	Layer	Slightly soft, Mottled orangeish brown, Silt	Turf debris
1510	Layer	Very soft, Brown, Silt, Turf(10%)	Slightly disturbed windblown layer with turf debris
1511	Layer	Slightly soft, Mottled dark brown, Silt, Mixed tephra (H4)	Upcast layer, associated with cemetery
1512	Layer	-	-
1513	Layer	Friable, Greyish-black, Ash & cahrcoal	Small midden-like deposit of ash & charcoal
1514	Layer	Friable, Very mottled dark reddish brown - grey, Turf fragments, silt, Charcoal	Turf debris, probably associated with farm mound
1515	Layer	Soft, Light brown, Silt	Slightly disturbed wind deposited material
1516	Layer	Soft, Mottled light brown, Silt, Turf debris (5%), White tephra (2%)	Slightly disturbed wind deposited context
1517	Layer	Soft, friable, Very homogenous, light brown, Silt, Turf debris	Turf debris associated with structure Z1(?). The northern edge of the context lieis agains a line of stones, which seems to belong to structure Z1.
1518	Fill	Firm, Mottled dark brown, Clayey silt, H3 tephra (10%), dark tephra-landnám? (8%)	Fill of grave cut [1532]
1519	Fill	Firm, Mottled light brown, Clayey silt, H3 tephra (3%), Reddish soil (4%)	Unexcavated grave fill
1520	Fill	Firm, Mottled light brown, Clayey silt, H3 tephra (5%), Black soil-landnám tephra (3%)	Unexcavated grave fill
1521	Layer	Soft, friable, Brown, Silt, Charcoal, turf	Turf debris layer
1522	Fill	Friable, coarse, Dark brown, Coarse sandy silt, Grass/root lenses; Compaction became a gradual greasy organic	Greasy organic fill of cut [1526]
1523	Layer	Friable, Homogenous brown, Silt, Charcoal (5%)	Mainly wind deposited context
1524	Fill	Compactable but soft, Grey-brown, Silt, Charcoal, turf debris, H3 tephra, all in minute amounts	Slightly disturbed but mostly natural wind deposited layer at the end of the trench next to a possibly more disturbed layer. Very similar to [1510] but with less mottled turf debris. Fill of [1554].

1525	Layer	Firm, Light-reddish brown, Turf debris, silt, Pebbles	Turf debris associated with Z1. Lies against and around line of stones that are not in their original position (slanting), ought to belong to the period when the structure was in ruins.
1526	Cut	Circular-oval, 1,18x1,13m / 0,22m deep, Sloping/bowl shaped	Modern (19th century?) truncation
1527	fill	Compact but soft, Grey-brown, Silt	Windblown loess. Fill of [1563].
1528	Layer	Soft, friable, Dark brown, Silt, Turf debris (20%), charcoal (2%)	Turf debris layer.
1529	Layer	Very compacted, possibly trampled, Light brown, Silt, 1477 tephra (disturbed)	Organic layer within structure Z1, possibly trampled, but not a clear floor
1530	Skeleton	Prone, Facing upwards, Humerus parallel to body, bent at elbow. Hand resting on sacrum, fingers pointing down, Arm parallel to body, wrist bent toward body, radius resting on ulna. Hand resting on left innominate, bones not in situ, Very fine ash deposit over thoracic vertebrae and ribs.	Inhumation; No coffin remains found, head at western end of grave
1531	Layer	Firm, friable, Light reddish brown, Silt, rocks, Turf debris	Wall collapse assocaiated with the southern wall of structure Z1
1532	Cut	Rectangular, Right angles, 0,36x1,69/ 0,24m deep, Northern edge - streight with slight slope. Southern edge - Undercut (due to the fact that it is truncated by [1520])	Grave cut
1533	Layer	Firm, Reddish brown, Silt, Charcoal (1%)	Possible remains of floor-layer, or else a surface, organic midden layer inside disused structure (Z1)
1534	Layer	-	Turf debris
1535	Layer	-	Turf debris
1536	Layer	Firm, friable, Mottled brown soil with patches of light yellowish brown and dark brown soil, Silt, Turf debris, charcoal (1%)	Turf debris
1537	Layer	Friable, Dark brown - mottled, Silt, Turf fragments, charcoal	Mixed debris layer associated with Z1
1538	Layer	Firm, Dark grey, Silt, sand, Charcoal (15%)	Greasy-organic layer within Z1, orgnaic midden-like deposit
1539	Layer	-	Turf collapse associated with structure Z1
1540	Layer	-	Turf debris associated with structure Z1 (not excavated)
1541	Layer	-	Turf collapse associated with structure Z1 (not excavated)
1542	Layer	-	Turf collapse associated with structure Z1 (not excavated)
1543	Layer	-	Turf collapse associated with structure Z1 (not excavated)
1544	Layer	-	Upcast and turf debris associated with structure Z1 (not excavated)
1545	Layer	-	Upcast associated with structure Z1 (not excavated)
1546	Structure	-	Stone structure associated with structure Z1
1547	Structure	-	Stone structure associated with structure Z1
1548	Structure	-	Stone structure associated with structure Z1
1549	Cut	-	Modern cut made by geologist
1550	Cut	-	Modern cut made by geologist
1551	Fill	-	Grave fill (not excavated)
1552	Fill	-	Grave fill (not excavated)
1553	Fill	-	Grave fill (not excavated)
1554	Layer	-	Slightly disturbed windblown loess (not excavated)

1555	Cut	-	Truncation (churchyard enclosure?)
1556	Layer	-	Slightly disturbed windblown loess (not excavated)
1557	Layer	-	Organic layer associated with structure Z1 (not excavated)
1558	Layer	-	Floor? (not excavated)
1559	Layer	-	Ash and charcoal deposit (not excavated)
1560	Fill	-	Possible grave fill (not excavated)
1561	Fill	-	Possible grave fill (not excavated)
1562	Fill	-	Fill of cut [1564]
1563	Cut	-	Narrow truncation, runs parallel to trench [1555]
1564	Cut	-	Narrow truncation, runs parallel to trench [1555]

3.23 Skeletal remains

As only one skeleton was excavated during the 1999 season at Hofstaðir, this report will only include a brief summary. However, the skeleton will be included in the discussion of skeletal remains after the Hofstaðir 2000 season.

Preservation: Good (75-90%)

Sex: Female

Age: Mature adult (46+)

Stature: 163.5?0.3cm

Palaeopathology: A total of five button osteomas, varying in diameter from 2-7mm are located on the left and right parietal bones and the frontal bone. Schmorl's nodes are found on the inferior and/or superior bodies of T6-T11 and in addition there is spondylolysis of L4. There is severe osteoarthritis of the right hip joint, with eburnation and increased porosity of both the acetabulum and femoral head and partial ossification of the transverse acetabular ligament. Both the right and left first metatarsals display osteochondritis of the proximal articular surface; there is a possible fracture of the proximal articular surface of the first distal phalange of the right foot and a bony growth (8mm in diameter) on the medial surface of the proximal end of the shaft of a right proximal phalange of the foot (possibly the third digit). There is a large (8x13mm) cloacae in the right side of the palate, extending from the first premolar to the second molar, and opening into the nasal cavity. The abscess which has resulted in this has completely destroyed the alveolar bone surrounding those teeth, and a quarter of the palate, leaving a cavity 13mm deep. The bone surrounding the cloacae is very porous and its edges are very sharp, showing no sign of healing, suggesting that this infection might be the cause of death.

Notes: There is a 6^{th} lumbar vertebrae.

3.24 Conclusion

The primary aim of the investigation of Area Z, to locate the church and graveyard, was accomplished successfully during the 1999 season at Hofstaðir. Although it is not as yet certain whether structure Z1 is the remains of the chapel or a later structure, the results of the geophysical survey, the identification of a 6x4m anomaly within a 30m diameter enclosure, which is compatible with an Icelandic medieval church or chapel, and the identification of 6-8 grave cuts orientated east - west within the enclosure suggests that within Area Z are the remains of a medieval chapel and graveyard.

The next step in the excavation of Area Z is threefold. The first is to complete the excavation of structure Z1, and identify if it is the remains of the chapel, and whether it overlies older structural remains. The second is to investigate whether cut [1555] is the remains of the churchyard enclosure, and to identify its extent. This will be done by opening an area along the perimeter of the enclosure as identified by the geophysical survey. It is hoped that those two tasks can be completed during the 2000 season. The third task is to start the excavation of the cemetery, and in 2000 Area Z will be extended approximately 4m to the east, as well as locating graves that may be situated to the north, south and west of structure Z1 in the current excavation area.

Acknowledgements
Special thanks to the excavators of Area Z; Jim Boyle, Ashley Hazel, Eugene Lewis, Andrew Leykam, Kevin Mears, Neus Pique and Mjöll Snæsdóttir, and those who assisted at various times, Colin Amundsen, Michele Besson, Elín Hreiðarsdóttir and Constance Rocklein.

3.3 THE FIELD ENCLOSURE (G. LUCAS)

3.31 The Bank Sections

Two 1m wide trenches were excavated across the major field boundary, one on the top of the ridge, the other downslope toward the river Laxá, in locations close to similar trenches placed in 1997 (see Figures 1.1, 3.9 & 3.10). The upper one (Trench I) showed the clearest stratigraphy and revealed four phases of construction: a primary turf bank and associated outer ditch, followed by a turf and stone bank, a turf bank and finally just embanked soil. This latest phase was sealed by the V-1477a tephra suggesting various construction phases are all Medieval or earlier. Landnam tephra was present in all the turves but no further tephra could be identified. In the lower trench (II), the sequence was less clear due to greater post-depositional disturbance and the boggy ground conditions; nevertheless, a comparable sequence for the first two phases was identified with a primary turf bank followed by a turf and stone wall. A third phase of turf bank was however quite different from that in Trench I and of post-Medieval construction as it had the V-1477a tephra *in* the turf blocks. It also had retained its shape much better. No ditch was recorded in association with this bank, but it is possible that one may exist beyond the limits of excavation - certainly the full extent of construction in the earliest phases was not reached on either side, due mainly to the thickness of the surface vegetation.

3.311 Trench I Context Descriptions

Context	Type	Description	Notes
0140	Layer	Spongey turf friable, Brown, Silt, Mixed roots/turf	May have truncated tephra slightly due to rebuild, though no evidence of collapse--tephra V1477 may have as a result been weathered (steaped appearance over the turf [141] and earth mix)
0141	Layer	Friable, Yellowish brown, Silt, Turfs-->mix (smaller pieces), Mixed turf in layer	windblown or soil buildup over bank; turf present in fill (lots of soil and Hekla 3 tephra (Magnus pers. comm.)--final phase of bank prior to 1477 tephra)
0142	Layer	Friable, Lower part of context darker yellowish brown, upper part slighly lighter, Silt	Windblown soil
0143	Structural Element	Compacted, yellowish brown silt with mixed tephra including LNL, H3, and Hverfjall, Five courses, two bonded with soil; laid lengthwise, turves c. 0.3m long	Upper bank construction
0144	Structural Element	Stone and soil, Irregular stone (0.3m) with a soil and turf core, larger stones toward the base, Redeposited aeolian	Stone wall bank construction
0145	Structural Element	Same as [143] though sandier texture and less tephra inclusions, 3 courses of shorter turves than [143]	Turf bank construction prior to, or contemporary with, [144]
0146	Structural Element	Similar to [143] but consistently darker and with more defined tephra showing which way up the turves have been laid, 4 courses, turves 0.3m	Primary turf bank construction
0147	Layer	Compacted, Greyish brown	Later than turf layers [146] at bottom of turf bank-->foundation for stone construction on top (presumably)
0148	Fill	Greyish brown--yellow and black patches of tephra, Silt	Ditch fill
0149	Cut	0.5m wide; length of excavation area: 1m; depth: 40cm, Steep break of slope at top and base, ca. 60 degrees concave U shaped	Linear ditch running N-S
0150	Structural Element	Turf and stone bank with ditch, 3 phases	Number given to entire structure

3.312 Trench II Context Descriptions

Context	Type	Description	Notes
0161	Layer	Soft, Dark brown and white tephra, mixed with creamy white, Silt, Fine roots	Tephra disturbed--Hekla tephra in turfs; foundation of bank with disturbed/degraded blocks of turf
0162	Layer	Soft, Turfs: dark brown, yellowish brown, green, Silt, Fine rooting , Tephra disturbed--green tephra in turf blocks	Stone wall sits on top of this turf wall
0163	Layer	Soft, From light to dark brown, Slightly sandy silt, Thin, fine rooting, flecks of white tephra	Infill to consolidate stone wall (upcast/infill)
0164	Layer	Soft, Dark grey, red/orange, white, greyish green--all mixed, Silt, Fine roots, Fragments of tephra in turfs	Turf wall collapse
0165	Layer	Soft, Light brown and mottled (white and dark brown), Silt, Fine roots, specks of white tephra	Repair infill of turf wall, between top turf wall [166] and collapse [164]
0166	Layer	Soft, Light reddish brown and dark brown, Sandy silt, Frequent fine rooting, Tephra disturbed	Top turf wall of field boundary bank, horizontally laid turfs
0167	Layer	Soft, Dark brown and stripes of light brown, Silt, Fine roots	Turf wall, foundation (?) probably contemporary with upcast layer [163]
0168	Structural Element	Turf and stone bank, 3 phases	Number given to entire structure

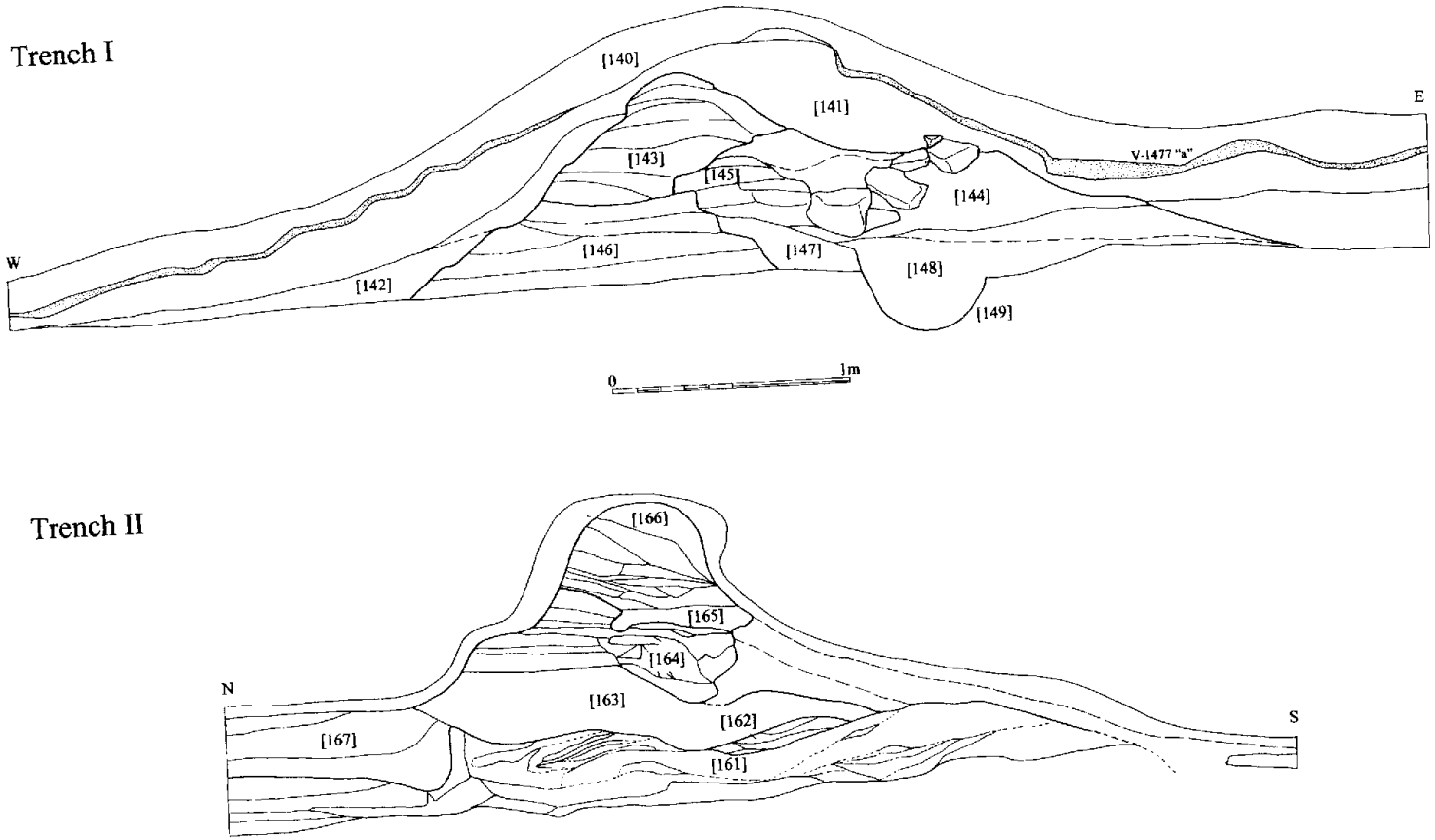


Figure 3.9 Field Bank Sections

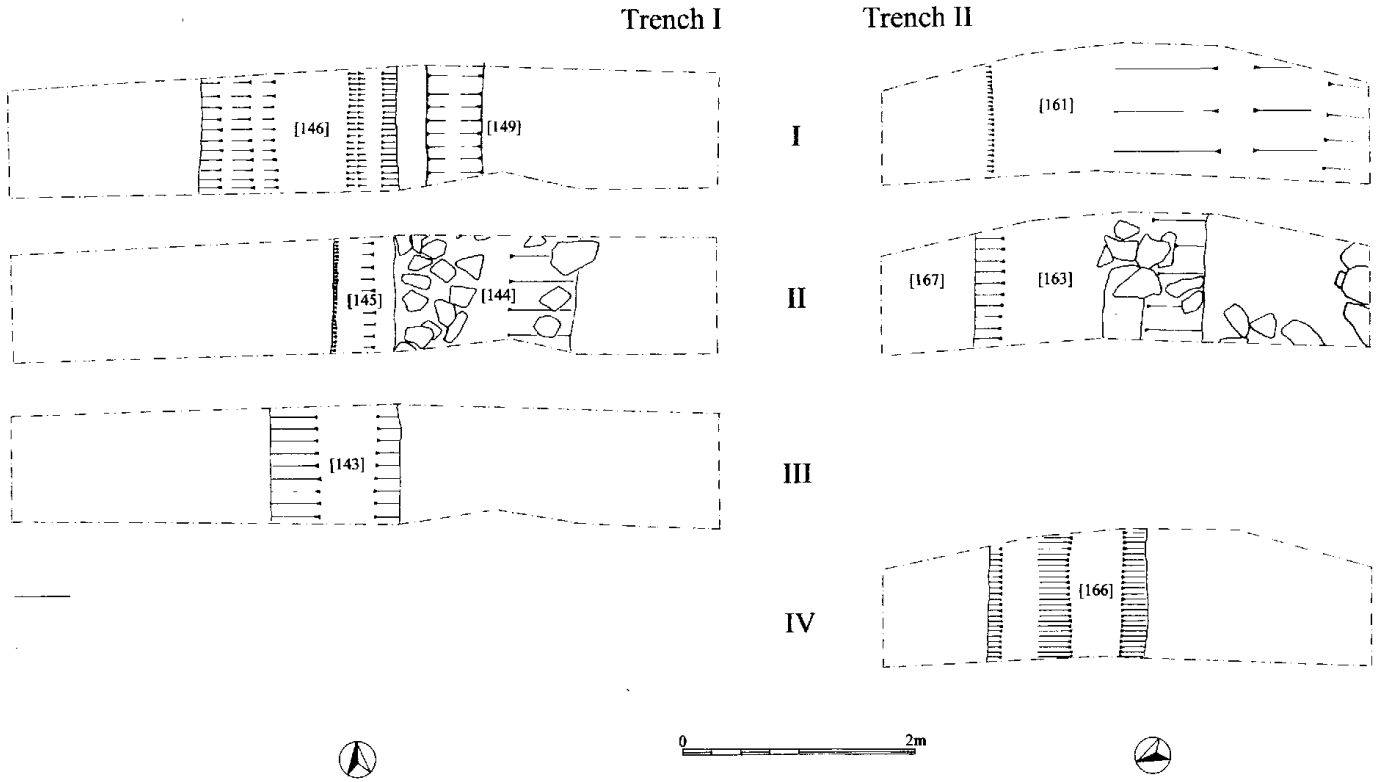


Figure 3.10 Field Bank Plans

4. GEOARCHAEOLOGICAL INVESTIGATIONS (K. MILEK & I. SIMPSON)

Karen B. Milek (Department of Archaeology, University of Cambridge)
Ian A. Simpson (Department of Environmental Science, University of Stirling)

4.1 INTRODUCTION

In 1999, geoarchaeological investigations at Hofstaðir pursued two main lines of inquiry. On the site itself, a geoarchaeological sampling program targeted floor deposits within structures in order to maximize the available data on living conditions and the activities that took place within the buildings during their use. This year, sampling concentrated on Area G, where excavations exposed the floor deposits and the turf collapse of a sunken-featured building. This sampling program forms part of an on-going study that uses geoarchaeological techniques to investigate the use of space on Viking Age Norse farmsteads. Off-site, a program of test pitting and soil sampling was carried out in order to assess the rates and patterns of soil accumulation and erosion on the Hofstaðir 'estate' over time. This investigation forms part of a historical study of land management and land degradation in 'home' grazing areas in Iceland. Both the on- and off-site sampling programs involved the removal of undisturbed blocks for micromorphological analysis, as well as undisturbed blocks and/or bulk samples for supplementary analyses such as organic geochemistry, mineralogy, phytolith, diatom and pollen analyses. A number of reference samples were also collected during the 1999 field season. From one of the off-site soil profiles, reference samples of tephra were taken in order to provide comparative material for the main tephra layers that have been found on the archaeological site. Also, in order to provide modern comparative analogues for the occupation deposits at Hofstaðir, the geoarchaeological sampling program at the turf farm of Þverá continued, this year concentrating on domestic livestock dung and the floor deposits within an abandoned turf sheephouse.

4.2 SOIL AND SEDIMENT SAMPLING: RATIONALE AND PROCEDURE

4.21 Investigation of Occupation Deposits on the Viking Age Farmstead

Since 1997, a research project has been underway that is assessing the application of geoarchaeological techniques such as micromorphological analysis, X-radiography and lipid analysis to the archaeological interpretation of the function of Viking Age Norse buildings and the organisation of space within them. This study has involved extensive sampling of the floor deposits within all of the excavated buildings at Hofstaðir. In 1999, this sampling program concentrated on the basal deposits of the 'great pit' in Area G. This feature has been one of the most interesting and controversial features at Hofstaðir, and since 1908 has been used to substantiate various interpretations of the site as a whole. The suggestion that the pit may originally have been a sunken-featured building (Friðriksson and Vésteinsson 1997) was recently substantiated by micromorphological analysis of a section profile through the midden sediments and the primary deposits at the base of the pit (Simpson *et al.* 1999). This analysis showed that immediately above the subsoil was a sequence of fine, compacted layers containing concentrations of charcoal and burnt bone, which were best interpreted as trampled floor deposits belonging to a sunken-featured building ([0009]). This floor layer then appeared to have been sealed by collapsed turf construction material ([0008]) prior to the use of the pit as a rubbish

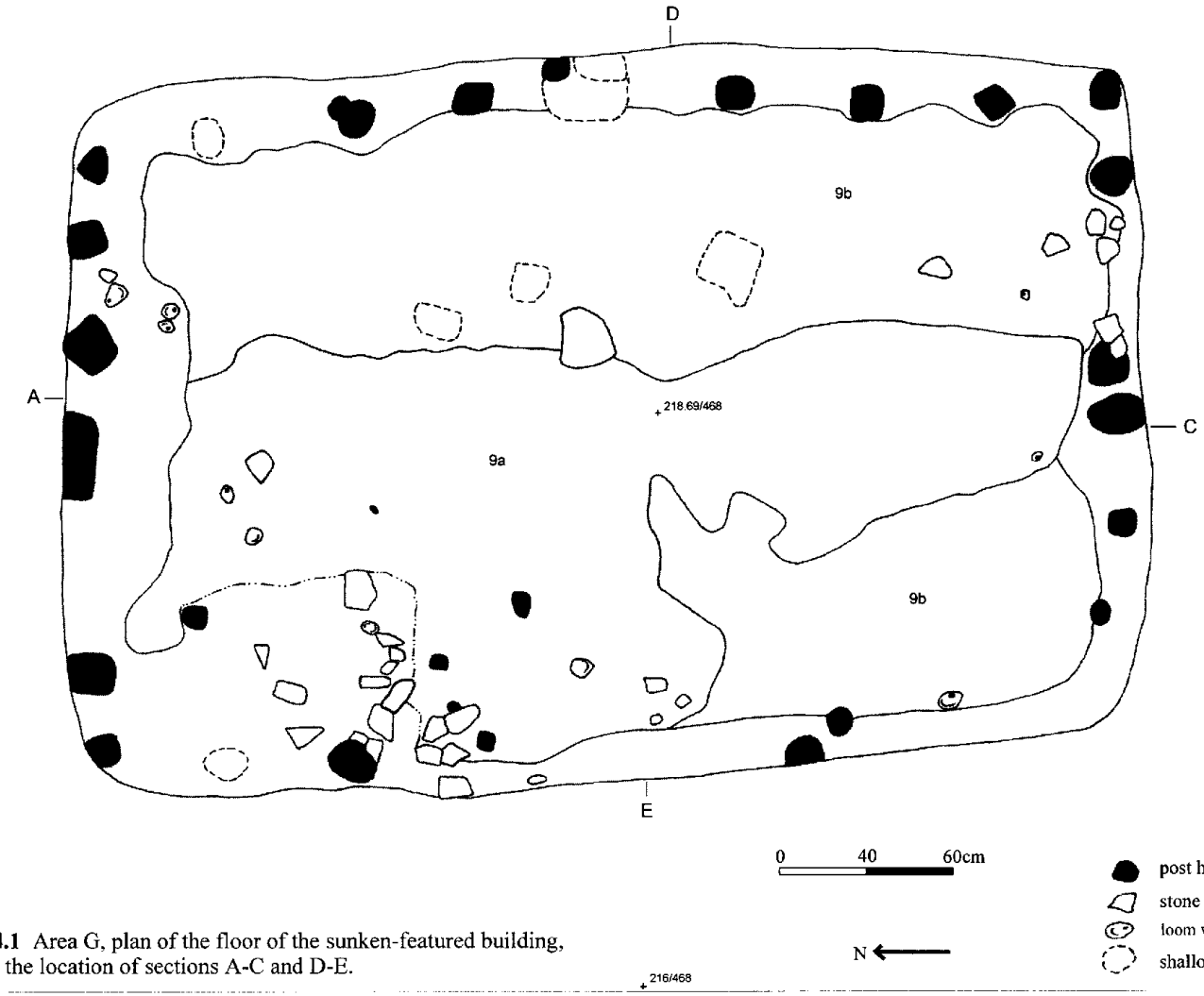


Figure 4.1 Area G, plan of the floor of the sunken-featured building, showing the location of sections A-C and D-E.

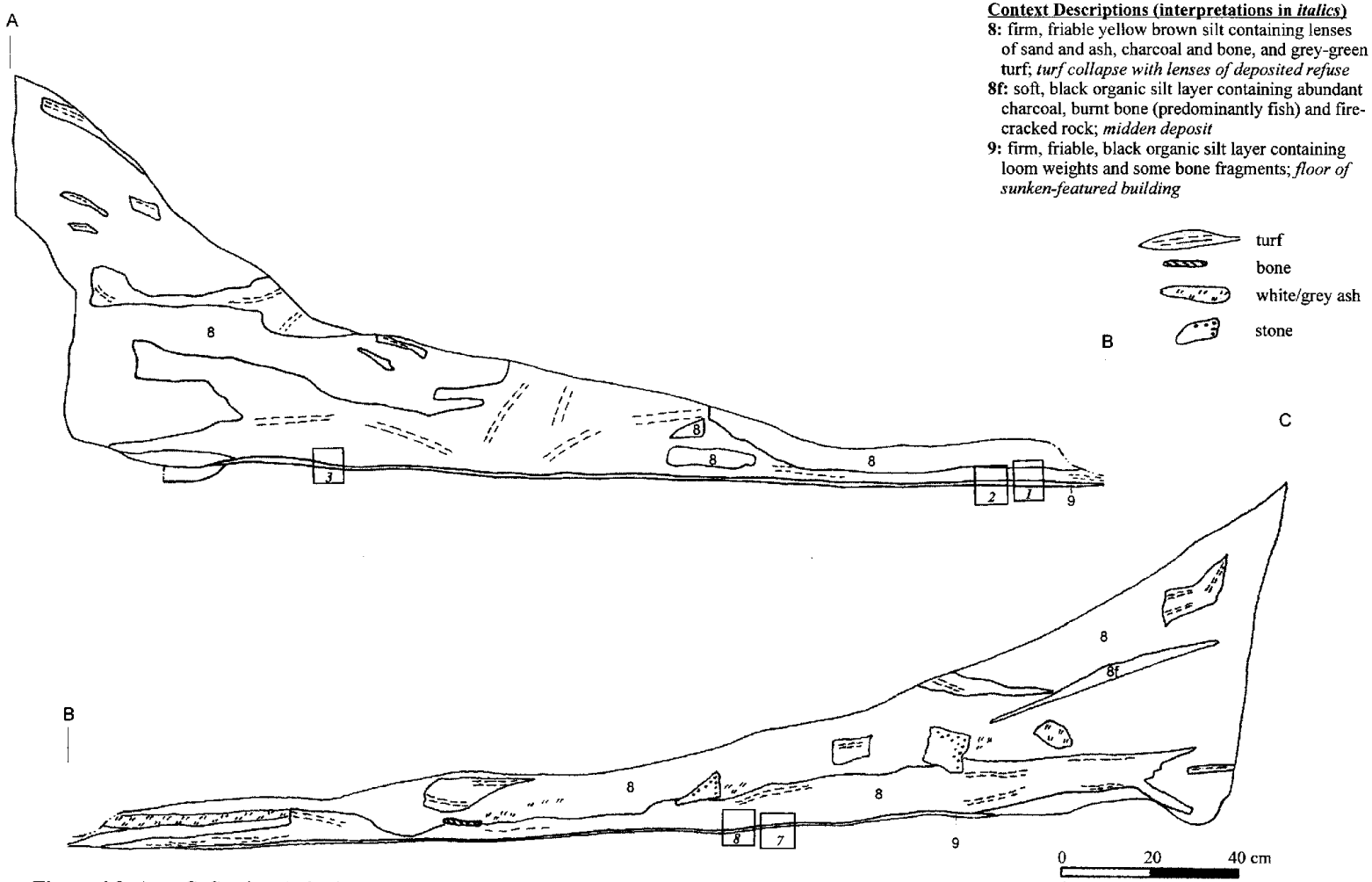
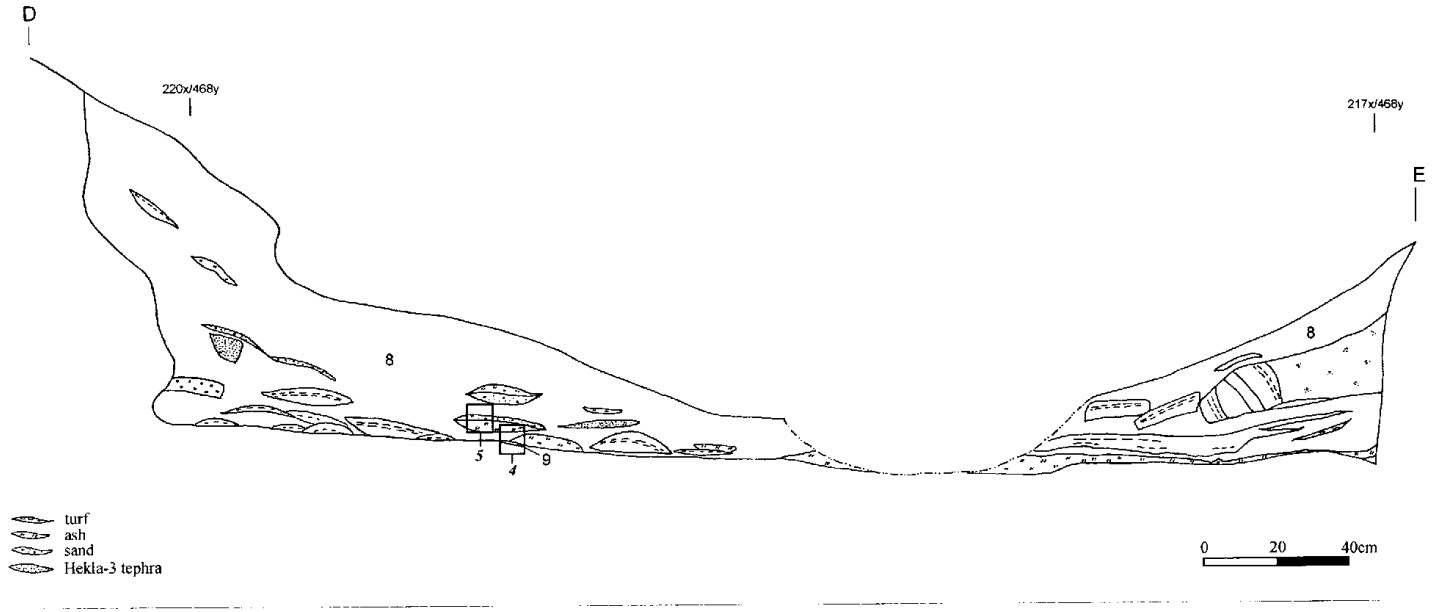


Figure 4.2 Area G, Section A-C, showing the location of micromorphology samples.



Context Descriptions (interpretations in *italics*)

8: firm, friable, yellow brown silt containing lenses of sand and ash, charcoal and bone, and grey-green turf; *turf collapse containing lenses of refuse*

9: firm, friable, black organic silt layer containing loom weights an some bone fragments; *floor of sunken-featured building*

Figure 4.3 Area G, Section D-E showing the location of micromorphology samples.

dump ([0006] and [0007]), results that supported the interpretation put forward by Friðriksson and Vésteinsson (1997; Simpson *et al.* 1999). One of the goals of the 1999 field season was to excavate the turf collapse that had been exposed in the previous year, to fully expose the primary deposits for the first time, and to thoroughly sample these primary deposits for micromorphological analysis.

The turf collapse within the sunken-featured building was excavated in opposing quarters, beginning with the north-west and the south-east quarters. This strategy exposed two profiles along the axes of the building which were ideal for obtaining micromorphology samples with some lateral variation (Figures 4.1-3). Because it was desirable to expose, photograph and excavate the floor as a whole, small sondages were excavated only where it was necessary to take micromorphology samples that included the subsoil, floor layers and the sealing turf collapse. Six micromorphology samples were taken from the primary deposits in this way, two of which have been set aside for future sub-sampling should this prove necessary (see Table 4.1). One micromorphology sample and one bulk sample were taken from a lens within the turf collapse that contained ash and sand in order to clarify the origin of this unusual material. All of these samples are currently being prepared at the University of Cambridge. Although the intention had been to take bulk samples from the floor itself ([0009]), this will have to await the full excavation of the floor deposits in the year 2000.

		SAMPLE NUMBERS (HST-99-XX)				
Area	**Sampling Location**	**Micromorph-ology Sample Numbers**	**Block Samples for Sub-sampling**	**Bulk Sample Numbers**	**Bulk Sample Location**	**Purpose of Bulk Sample**
G	N-S profile: Floor	01 03 08	02 07			
	E-W profile: Floor	04				
	Turf collapse	05		06	Dark gray sand associated with ash lens in Context [0008]	Mineralogy

Table 4.1 Summary table of sediment samples taken from Area G

4.22 Landscape Investigations

Since the mid-1980s it has become increasingly clear that explanations of landscape change cannot solely rely on a mechanistic understanding of the inherent sensitivity and resilience of landscapes to externally imposed variations in climate and human activity. Driven largely by issues of land degradation, the social and natural sciences have increasingly been attempting holistic studies of landscape change under varying political and socio-economic contexts, particularly in relation to land tenure. However, ecological concepts applied to questions of landscape sensitivity have often lacked rigorous assessment and have frequently failed to provide historical depth, resulting in ill-judged assessments and policy responses.

Using concepts derived from historical ecology, a series of studies are now underway to examine the historical relationships between land tenure and land degradation in Iceland. One study has already considered common grazing land (*afréttur*) management and its role in historic soil erosion in southern Iceland and has concluded that a lack of appropriate regulation of domestic livestock on sensitive common grazing areas could be attributed to limited cultural knowledge of changing and rapidly fluctuating environmental conditions (Simpson *et al.*, in press). The site of Hofstaðir and its 'estate' provide an opportunity to contrast the management of common grazing areas with the analysis of a 'home' grazing area associated with an early farmstead, and with excellent archaeological information to provide social context. The study area of Hofstaðir will therefore be used to test the hypothesis that 'home' grazing areas associated with early settlement sites in Iceland were managed at a level that was intended to prevent land degradation.

The field season in 1999 was used to collect samples and data that will permit the assessment of the rates and patterns of soil accumulation and erosion in the Hofstaðir 'home estate' grazing area. The following procedure was followed:

? A black and white aerial photograph at a scale of 1:5,000 (1978) was used to identify the location of areas sensitive to erosion. These observations suggest that there is only localised erosion on the Hofstaðir 'estate' and that it is confined to breaks in slope and footpaths close to the farm site, and to areas of sheet erosion immediately south-west of Sandvatn. The aerial photograph, together with field surveys, are also currently being used to develop a vegetation map of the Hofstaðir estate and will provide a foundation for grazing models and their relationship to land degradation.

? Historical information on the numbers of domestic livestock at Hofstaðir has been collected from *Jarðabók*, and will provide input data for grazing models and the re-construction of grazing strategies.

? Three east-west transects running across the estate were randomly selected and twelve randomly selected soil profiles were placed on each transect, giving a total of thirty-six profiles for inspection. The location of each profile was recorded with GPS and the soil profiles were exposed in order to permit the description of horizons and the measurement of soil accumulation between well-defined and consistent tephra layers. These tephra layers included Hekla-3, (*c.* 2,800 BP), Hverfjall (*c*. 2,500 BP), the *Landnám* sequence (871 ± 2 AD) and the so-called Layer 'a' (1477 AD), which already have well-known micromorphological properties (Simpson *et al.* 1999). These field observations will permit the assessment of the rates of soil accumulation on the Hofstaðir 'estate' over time.

? From three of the soil profiles, fourteen undisturbed samples were collected in Kubiena tins for preparation as thin sections. These samples are currently under preparation at the University of Stirling. The description of the thin sections, supported by image analysis and scanning electron microscopy, will permit distinctions to be made between local and regional sources of accumulated soil.

These data sources, when considered in relation to the emerging archaeological information, provide the basis for a comprehensive historical analysis of land management and its relation to land degradation in a 'home' grazing area in Iceland.

4.23 Reference Sample Collection Program

4.231 Tephra from an Off-Site Soil Profile

A number of tephra layers are found on site, either *in situ* above or below the archaeology, or actually within the archaeological deposits. In addition to the tephra that is incorporated into turf building materials and peat ash deposits, several tephra layers interact with the archaeology in a particularly interesting way, since they formed the natural base of negative features or floor deposits on the site. The *Landnám* tephra sequence, for instance, was sealed by a sheet midden deposit ([1134]) and the floor deposits ([1087]) in Structure E-2 (Milek *et al.* 1998, 72). The Hverfjall tephra layer formed the base of the cut for the trough-like feature in Structure E-2, and was found to have been stained by the material infilling the trough ([1111]) and possibly also by the percolation of liquid through the base of the feature (*ibid*., 72). Preliminary analysis of thin sections taken in 1998 confirms that the Hverfjall tephra layer at the base of the trough had indeed been altered by unusual chemical conditions that can only have been a result of the use of the trough (e.g. phosphatic and iron compounds that usually form under reducing conditions). The Hekla-3 tephra layer formed the base of the cut for the sunken-featured building, Structure D-1. Since this layer acted as the floor surface, it was drastically altered by the processes of trampling and compaction, particularly in the middle of the structure.

Tephra Layer	**Micromorphology Sample**	**Bulk Sample(s) for Mineralogical Analysis**	**Sheer Strength Sample**	**Compressive Strength Sample**
1477 "a"	x	x		
Landnám sequence	x	xxxxx		
Hverfjall	x	x		
Hekla-3	x	x	x	x

Table 4.2 Summary table of tephra samples taken from an off-site natural profile

Due to the ubiquity of these tephra layers on the site, and the ways in which they interact with the archaeology, it was deemed necessary to take a number of comparative reference samples from an exposed natural soil profile off-site. Test-pit HST 3/4 was chosen for this purpose, since it had the most complete tephra sequence, and since it was partially cut by a bank, which increased the ease of sampling. Micromorphology samples and bulk samples were taken from the 1477 "a", *Landnám*, Hverfjall and Hekla-3 tephra layers (see Table 4.2). Of these, the micromorphology sample from the Hekla-3 layer is perhaps the most important, since the analysis of pore space will provide a natural bulk density measurement, with which the trampled and compacted floor samples in Structure D-1 can be compared. Samples for shear strength tests and compressive strength tests were also taken from the Hekla-3 tephra layer in this test pit. These will be particularly valuable for the ongoing research project on the identification and interpretation of floor surfaces on Viking Age Norse sites, which is incorporating information on different types of floor surfaces and the ways in which they alter under the process of trampling.

4.232 Floor Deposits from a Recently Abandoned Sheephouse at Þverá

Since 1997, an ethno-archaeological study has been carried out at the abandoned turf farmstead of Þverá, which is 14.5 km downstream from Hofstaðir in the Laxárdalur. The goal

of the project is to develop a model about the use of and maintenance of space within turf structures in Iceland by studying in detail the preserved floor deposits, and by collecting other reference samples relevant to the interpretation of occupation deposits on archaeological sites. In the 1999 field season, this investigation concentrated on the floor of an abandoned sheephouse, and reference samples of turf and animal dung for comparative purposes. According to Áskell Jónasson, who has lived and farmed at Þverá since the 1940s and is the caretaker of the turf buildings there, the sheephouse was built at the turn of the century, and has not been in use regularly for the over-wintering of sheep for approximately 50 years. Since then, it has been used only once in a while, mainly during the lambing season, and Áskell affirmed that it had not been cleaned out since it was abandoned. It was quite likely, therefore, that the sheephouse would provide well preserved floor deposits that would serve as excellent reference material for the archaeological deposits at Hofstaðir.

With the assistance of Connie Rocklein, two north-south sampling trenches were excavated within the sheephouse, one between the south wall and the feeding trough, and one just within the threshold (Figure 4.4). The deposits on the floor of the building seemed to be composed of layers of densely matted hay and dung, which were especially compacted within the threshold of the building. Once the exposed sections were photographed, drawn and described, micromorphology and bulk samples were taken in such a way as to sample most thoroughly any vertical or lateral variation in the composition and structure of the floor deposits (see Table 4.3 and Figure 4.5).

A number of comparative reference samples were also taken from Þverá and elsewhere in the Laxárdalur. Since turf was used as a floor surface material in the main house at Þverá, reference samples of fresh turf for micromorphological and bulk density analyses were taken in 1998 from the open turf cutting down slope of the farmhouses. In 1999, this set of reference samples was supplemented with turf samples for sheer strength and compressive strength tests. These soil mechanics tests, which will also be conducted on the Hekla-3 tephra layer (see above) and a number of more common sediments used as flooring material in northern Europe, will contribute to an ongoing research project on floor materials of different types, and the various ways in which they react to the process of trampling. Comparative reference samples of animal dung were also taken for micromorphological analysis. From Þverá itself, two samples of sheep dung were taken, while samples of horse and cow dung were taken from other nearby farms in the Laxárdalur. It is hoped that, in thin section, these different dung types will prove to be distinguishable, so that micromorphological analysis can contribute further to the interpretation of archaeological features and buildings associated with livestock management (e.g. animal enclosures, byres, stables, sheephouses).

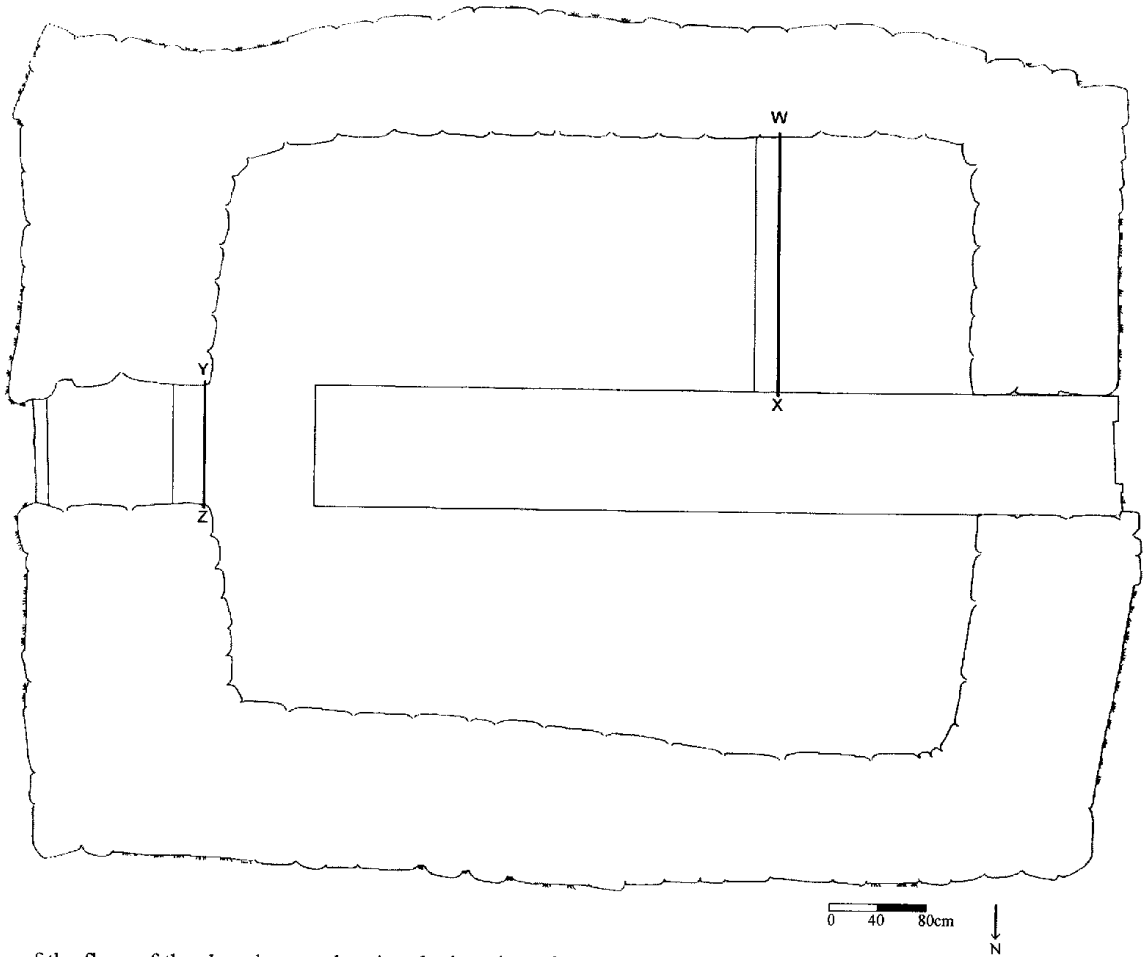


Figure 4.4 Þverá, plan of the floor of the sheephouse, showing the location of sampling trenches and Sections W-X and Y-Z.

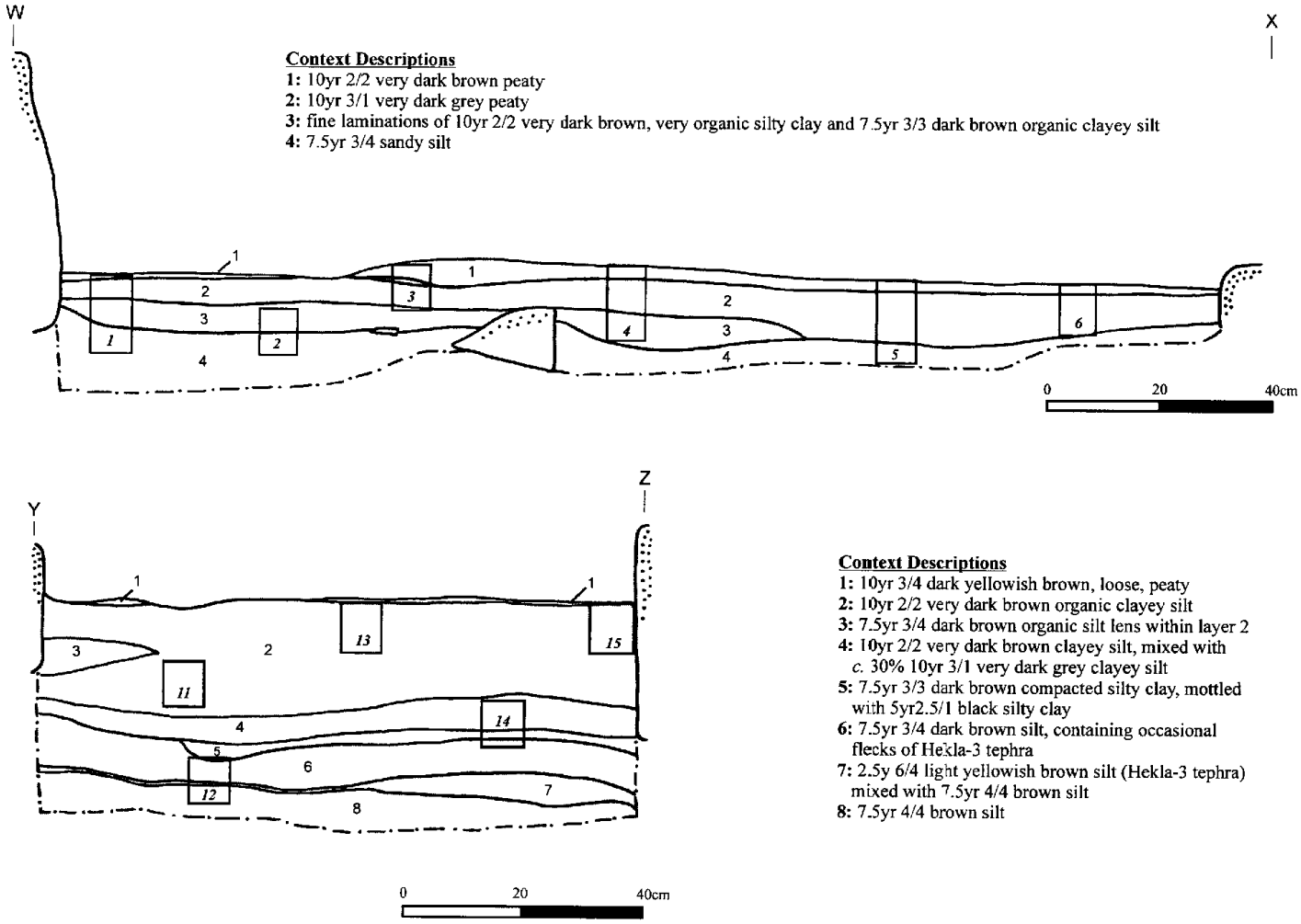


Figure 4.5 Þverá, sheephouse, sections W-X (interior floor) and Y-Z (threshold floor), showing the location of micromorphology samples.

	SAMPLE NUMBERS (ÞVR-99-XX)				
Sampling Location	**Micromorphology Samples**	**Bulk Samples**	**Bulk Sample Location**	**Sheer Strength Sample**	**Compressive Strength Sample**
Sheephouse floor (Profile W-X)	01 02 03 04 05 06	07 08 09 10	Layer 1 Layer 2 Layer 3 Layer 4		
Sheephouse threshold (Profile Y-Z)	11 12 13 14 15	16 17 18 19 20 21	Layer 2 Layer 3 Layer 4 Layer 5 Layer 6 Layer 7		
Turf	xx			x	x
Dung: *Sheep pellets* *Sheep 'sausage'* *Cow* *Horse*	 x x x x				

Table 4.3 Summary table of soil, sediment and dung samples taken from Þverá and surrounds

4.3 METHODS FOR PROCESSING AND ANALYSIS OF SAMPLES

Micromorphology samples will be manufactured and analysed at the Universities of Cambridge and Stirling. They will be dried using acetone replacement of water, impregnated with a crystic polyester resin, and thin sectioned following the method described by Murphy (1986). Thin sections will first be studied under a light box at a scale of 1:1 and will then be analysed using petrological microscopes at magnifications ranging from x4 to x400. Several different light sources will be used, including plane polarised light, crossed polarised light, circular polarised light, oblique incident light, and ultra-violet light. Digital image capture and analysis will be used in addition to standard descriptions, all of which will conform to the internationally accepted terminology in Bullock *et al.* (1985). In addition, electron microprobe analysis may be conducted on some uncoverslipped thin sections in order to clarify the elemental composition of features that proved difficult to identify by thin section analysis alone.

In thin section, it will be possible to identify and quantify the mineralogy, structure and texture of soils and sediments, as well as any bone, shell, artefacts, coprolites, phytoliths, diatoms, ash crystals, pollen, charcoal and plant remains that are present. In addition, it will be possible to observe the presence of iron, manganese, phosphorous, carbonates and clay minerals, the mobility of which can be linked to specific environmental conditions. The interpretation of thin sections will be aided by reference to the experimental and ethno-archaeological materials collected by the authors and other researchers, and by the accumulated experience of other soil

scientists who have been applying micromorphological techniques to archaeological questions (e.g. Courty *et al.* 1989).

4.4 Conclusions and Proposals for Future Work

Preliminary analysis of micromorphological samples taken from occupation deposits at Hofstaðir in 1997-8 has shown that the technique can provide the type of high-resolution data that is needed for interpreting the living conditions and the activities that took place within buildings. Although the analysis of the thin section taken from the base of the sunken-featured building in 1997 revealed that the central part of the floor deposit was made up of fine charcoal and bone fragments, the complete exposure of the floor in 1999 showed that it was not uniform in thickness, extent or composition. The analysis of the micromorphology samples taken in 1999 will provide more detailed information about the composition of the floor deposits in Area G and their lateral variation, and will therefore allow a better-informed interpretation about the use of space within the building. In the year 2000, it is expected that more floor deposits will be exposed in structures in Area AB, and that micromorphology sampling will again be employed to assist in the interpretation of these layers.

The interpretation of micromorphology samples taken from occupation deposits at Hofstaðir continues to benefit from the ethno-archaeological analogue provided by the abandoned turf house at Þverá. The project carried out in the abandoned sheephouse during the 1999 field season concluded the geoarchaeological sampling program at Þverá, and the next couple of years will see the completion of the analysis of the thin sections and the comparison of these samples with the archaeological samples taken from Hofstaðir. The work at Þverá has opened up several interesting avenues for future research in the fields of experimental archaeology (particularly building construction and fuel consumption), the study of site formation processes, and the cultural processes involved with the care and maintenance of living surfaces in Iceland. In the future, it is hoped that Þverá can be used as a springboard for continuing research into turf houses, what living conditions were like inside of them, how they were maintained, and how they decompose after abandonment. Of primary importance is a further understanding of the practice of intentionally depositing ash and charcoal on the floors of the kitchen and byre. The issues involved include scientific evidence for the practical functions of this behaviour, the extent to which this behaviour may have an embedded symbolic meaning, and how widely spread the practice was. Such issues need to be approached not only through the geoarchaeological investigation of other abandoned turf houses, but also through historical and ethnographic sources.

The environmental investigations that began in 1999 form a starting point for an assessment of the degree of land degradation in the vicinity of Hofstaðir, and how this can be related to history of livestock management on the farm since it was first established. In the future, this study will focus on integrating the analyses of landscape change in the vicinity of Hofstaðir to parallel analyses in the south of Iceland. This work will form part of a PhD studentship research project recently started at the University of Stirling. Using the methodology outlined above, it is proposed that in future field seasons, the history of the relationship between domestic livestock grazing and land degradation should also be examined on the 'estate' of the smaller and more peripheral Sveigakot site. Similar analyses will also be undertaken of the *afréttur* area associated with Mývatnssveit, and grazing models will also be used to determine the role of hay production at the farmsteads of Hofstaðir and Sveigakot.

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5. GREINARGERÐ UM GJÓSKULÖG (MAGNUS SIGURGEIRSSON)

Magnús Á. Sigurgeirsson (Fjallalind 123, 200 Kópavogur)

Greinargerðin byggir á athugunum á tímabilinu 13.-16. ágúst 1999. Skoðuð voru snið á uppgraftarsvæðinu, einkum við bænhústóft og í túngarð austan og suðvestan Hofstaða. Varðandi greiningu gjóskulaga við Hofstaði vísast til fyrri greinargerða.

5.1 BÆNHÚS OG GRAFIR-VÍSBENDINGAR UM ALDUR

Inni í sjálfri bænhústóftinni, og nokkuð suðurfyrir hana, er torf með gjóskulaginu V-1477 (a-laginu). Annað gjóskulag var ekki sjáanlegt í þessu torfi. Nokkur gjóskulög voru í bökkum uppgraftarsvæðisins. Gjóskulagið V-1477 var hægt að rekja í SV-horni svæðisins og einnig í skurðinum sem grafinn var til austurs frá tóftinni. Mæld voru snið í vesturbakkanum og austurenda skurðarins (sjá meðfylgjandi snið). Í fyrrnefnda sniðinu voru fjögur dökk gjóskulög, H-1300, V-1477, lag frá fyrri hluta 16. aldar og sennilega lagið V-1717. Í sniðinu voru ummerki um jarðrask fyrir árið 1300. Þá hefur verið grafið niður að Hverfjallsgjóskunni, af óljósum ástæðum, og jarðvegur með Landnámssyrpunni (LNS) m.a. fjarlægður. Elsta greinanlega gjóskulag frá því eftir LNS er H-1300. Sami háttur hefur verið hafður á við austurenda skurðarins (sjá snið). Hins vegar er LNS til staðar í vesturenda skurðarins og áfram til vesturs.

Grafir hafa verið teknar í gegnum LNS og gjóskulagið Hekla-3 (2900 ára gamalt). Virðist sem grafirnar hafi verið teknar tiltölulega skömmu eftir að LNS myndaðist, en einungis 1-2 cm af jarðvegi hafa verið ofan á henni þegar það var gert. Gjóskulagið H-1300 er í jarðvegi 10-15 cm yfir greftri úr gröfunum, sem bendir til að þær séu verulega eldri en gjóskulagið. Út frá afstöðu grafanna til gjóskulaga má segja með nokkurri vissu að þær séu frá tímabilinu 1000-1200 e.Kr., nær aldri þeirra verður vart komist að sinni. Rétt er að taka fram að fáar grafir voru komnar í ljós um það leyti sem undirritaður var á Hofstöðum, er vel hugsanlegt að grafir af öðrum aldri séu einnig við bænhúsið.

Líklegt verður að telja bænhúsið, a.m.k. elsta gerð þess, sé frá svipuðum tíma og grafirnar. En um það verður ekkert staðhæft að svo stöddu. Í bökkunum við jaðra uppgraftarsvæðisins kom ekkert fram sem gefið gæti óyggjandi vitneskju um aldur bænhússins. Telja verður líklegt að við áframhaldandi rannsókn komi fram einhverjar vísbendingar um aldur þess.

5.2 TÚNGARÐUR

5.21 Snið í túngarð austan Hofstaða

Eina sjáanlega gjóskulagið sem liggur upp að garðinum og yfir hann er gjóskulagið V-1477. Á einum stað er þó vottur af öðru dökku gjóskulagi yfir honum, hugsanlega V-1410. Gjósku V-1477 hefur skafið í skafla beggja megin garðsins en ekki fest ofaná honum að ráði. Greinilegt er að garðurinn hefur staðið allhátt þegar gjóskufallið átti sér stað. Garðurinn ber glögg merki viðgerða, a.m.k. tvisvar sinnum. Í honum má greina þrjár gerðir torfs.

Þegar garðurinn var reistur hefur verið stungið niður með honum beggja megin. Landnámssyrpan er óskert undir garðinum en hefur verið fjarlægð beggja megin við hann.

Vafalítið hefur torf og mold næst garðinum verið notað sem byggingarefni. Skipta má byggingu garðsins í þrjú skeið:

I. Elsti hluti garðsins er úr torfi sem hefur í sér LNS. Jarðvegur ofaná LNS hefur verið þunnur, vart meira en 1 cm þykkur, þegar torfið var stungið.
II. Torf með LNS. Í þessu torfi er þykkari jarðvegur ofaná LNS, um 2-3 cm. LNS er óskýrari en í elsta torfinu.
III. Áberandi eru slitrur af Heklu-3 ásamt LNS í torfinu (fyllingarefni ?). Torfið nær upp undir grasrót, um 3-4 cm eru frá yfirborði niður að því.

Ekki er unnt að tímasetja hvert þessara skeiða en telja má víst að garðurinn hafi verið í notkun um langan tíma. Elsti hluti garðsins gæti verið frá 10. öld. Síðasta skeiðið (III) gæti verið frá því eftir 1300, en fyrir 1477, þar sem gjóskulagið H-1300 er ekki sjáanlegt við garðinn. Vænta mætti þess að gjóskulagið H-1300 sæist við garðinn hafi ekki verið hróflað við honum eftir þann tíma.

5.22 Snið suðvestan Hofstaða

Engin gjóskulög lágu upp að eða yfir þennan garð. Gjóskulögin H-1300 og V-1477 eru áberandi í torfi garðsins. Á einum stað neðarlega í honum er torfflekkur með LNS. Bendir allt til að þessi garður (eða garðhluti) hafi verið byggður á síðustu öldum, í fyrsta lagi á 16. öld en sennilega síðar. Garðurinn stendur vel yfir umhverfi sitt í dag sem bendir til að hann sé fremur ungur.

5.3 HOFSTAÐIR/BÆJARHÚS

Rannsóknir sumarsins leiddu í ljós að það gjóskulag sem talið hefur verið Landnámslagið við Mývatn er í raun annað nokkru yngra gjóskulag. Athuganir í Sveigakoti í Sellöndum benda til að lagið geti verið frá því um 950 e.Kr. (sjá greinargerð 9902). Leiðir þetta óhjákvæmilega til þess að endurskoðunar er þörf á fyrri aldursgreiningum á Hofstöðum. Æskilegt er að gera nákvæmar athuganir á efstu lögum LNS, gerð gjóskunnar og útbreiðslu laganna.

6. ZOOARCHAEOLOGY: SOME PRELIMINARY NOTES (C. TINSLEY)

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6.1 INTRODUCTION

Hofstaðir has generated important data over the last several years for researchers interested in Iceland's settlement period. Overwhelmingly, the most numerous find throughout the site has been faunal material. With a total number of fragments recovered currently numbering over 50,000, enough data has been collected to allow for some preliminary analyses focusing upon selected contexts dating to three different time periods at the site. However, the bulk of the 1998 collection and the whole of the 1999 collections remain to be analyzed, and all conclusions drawn here are necessarily tentative.

With Daniel Bruun's 1908 excavation (Bruun & Jonsson 1909), Hofstaðir became the first site in Iceland in which animal bones were systematically recovered and analyzed by the pioneering zooarchaeologist Herluf Winge of the Zoologiske Museum in Copenhagen (H. Winge in Bruun & Jonsson 1909). While animal bone was recovered from several contexts excavated or tested by Bruun, the majority of the 1908 collection, and the bulk of the 1996-98 collections come from the fill of feature G. Additionally, a test pit dug by Bruun in area E also indicated the presence of another possible midden deposit, excavated in 1998 as context 1144.

Upon the completion of the 1998 field season at Hofstaðir, area G was cleared of all stratified midden material, apart from a small deposit mixed with wall fall that was left to the 1999 structural excavation of the G pit house floors. The midden context [1144] from area E was located and completely excavated as well. Thus, since Hofstaðir was reopened in 1995, a substantial amount of bone bearing midden material has been stratigraphically excavated and now represents the largest archaeofauna dating to the settlement period in Iceland. The FSÍ excavations at Hofstaðir have utilized the NABO standardized sieving protocol (100% 4mm mesh dry sieve backed by 0.5 mm flotation of smaller systematic and spot samples) for all soil removed from the site, and fragments down to 1mm make up a substantial fraction of the current collection. All efforts have been made to maximize faunal data capture, and we feel that bone loss during excavation has been minimal. Such intensive recovery inevitably produces analytical backlogs, and it will be several years before the very large 1998 archaefauna is completely processed.

As discussed in earlier reports (Amorosi & McGovern 1997, McGovern 1998), the midden deposit filling area G was layered stratigraphically from [0004] series to [0008] series with appropriate subdivisions (see Simpson et al. for pedalogy discussion). Due to the vast amounts of material excavated from areas G and E in 1998, a sampling strategy was devised to allow for a detailed analysis of a subset of the complete faunal collection. Concentrating on the complete first stage analysis of a few of the contexts (dated to different time periods) allows for a preliminary study of diet/economic strategies over time in one site. The complete analysis of all material for all contexts is currently underway under the overall supervision of Dr. T.H. McGovern, in active co-operation with NABO members Dr. Sophia Perdikaris (Brooklyn College, fish bone) and Dr. Ingrid Mainland (U Bradford, dental attrition).

We currently are focusing on faunal material from three separate contexts representing continuous site activity from approximately 880-900 AD to 1000-1050 AD. The first two contexts are separate layers from feature G. Feature G is an extremely rich, highly stratified

midden deposit filling a semi-subterranean pithouse structure. At the bottom of the fill from G is context [0006hk], which has been c14 (AMS, cattle bone) dated to a calibrated mean of 880 AD+- 40. Above [0006hk] (ca 60-80 cm) and capping the fill from G is context [0004], tentatively dated to ca AD 950.

The third and most recent context is a midden deposit located outside one of the great hall entrances (Area E). This context, [1144], we believe to be stratigraphically equivalent to the great hall and later than the [0004] deposit. Thus, the current chronology for the three contexts begins with the [0006hk] deposit in the late 9th century, followed by context [0004] in the mid-10th century, and ending with the [1144] context in the late 10th-early 11th century. Note that some contexts now under analysis from feature G predate [0006hk] and a great deal of un-analyzed material separates [0006hk] from [0004] in the unit G fill.

6.2 SAMPLE TAPHONOMY & CONTEXT COMPARABILITY

Context comparability is of great importance in any archaeological analysis, and the many taphonomic factors affecting bone deposition and survival make these issues even more important in zooarchaeology. Context [0004] caps the G deposit but derives from a widespread sheet midden of unknown origin. A similar deposit has been detected throughout much of the site. Context [0006hk] is a lower stratum from a midden deposit entirely contained within the G deposit, and derives from occupations earlier than [0004] but somewhat after the abandonment of the pit house. Context [1144] is ca 75 m away from [0004] and [0006hk], and appears to have accumulated outside the western side door of the great hall. All three deposits were rich in well preserved bone, wood charcoal, iron, stone, glass, and organic artifacts, fire cracked stones, and bits of smithing slag. However, the differences between the location and reconstructed depostion of these three contexts indicates that direct comparability of their bone assemblages needs to be established rather than assumed.

Sample size is a major issue in zooarchaeology, and inclusion of very small collections has been demonstrated to be a source of "noise" (Grayson 1984, McGovern 1985). In the present case all three contexts contained over 1000 identified bone fragments (NISP), exceeding the NABO Zooarchaeology Working Group recommended minimum sample size for inter-site comparison. However, if the three contexts had been generated by very different activities (eg. primary butchery area vs mixed domestic refuse) or were subjected to very different levels of fragmentation or burning, they still might produce collections not well suited to inter-period comparison of overall economic change. Faunal material from all three contexts reflects similar fragmentation as can be seen by the average size of recovered material (Figure 6.1). The large maj slightly high me basic patt ents.

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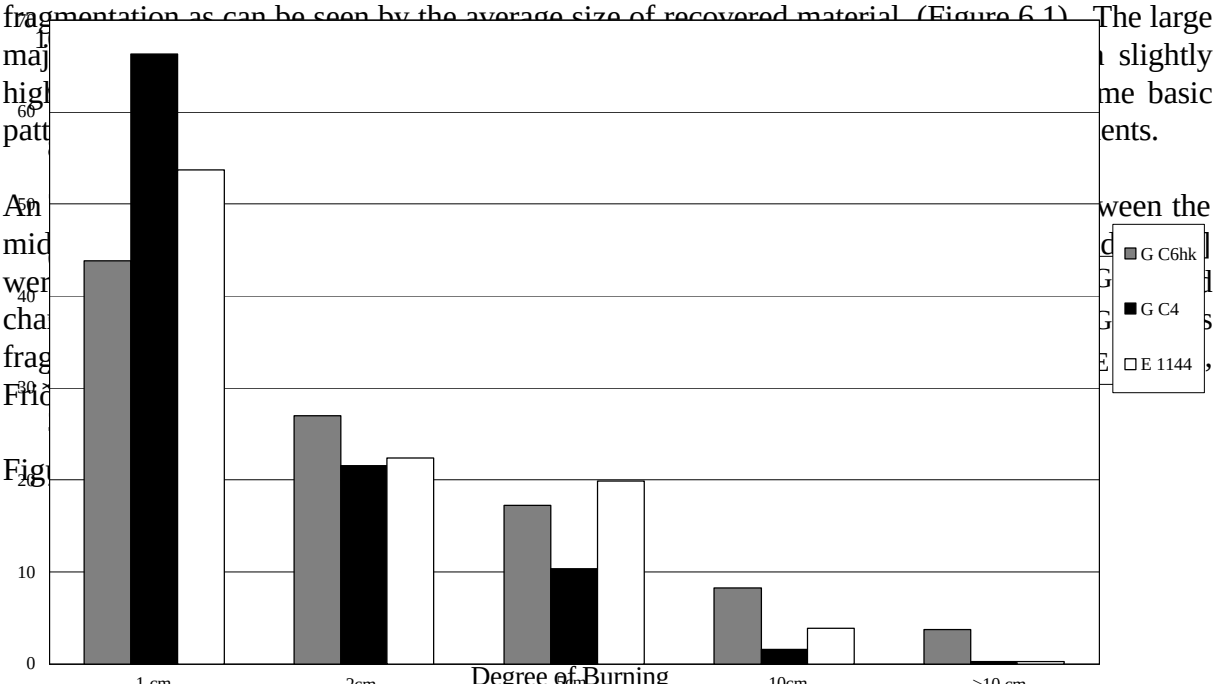

Figure 6.2 Degree of Burning on bones from selected contexts

press) this pattern does not support earlier suggestions that G's original purpose was a cooking pit (Olsen 1965). Again, patterns of burning appear broadly uniform across the three contexts, and all three appear to derive in part (but not predominately) from hearth cleaning activities.

In addition to similarities in both fragment size and percentage of burned fragments, the various contexts also shared in the distribution of skeletal elements present. Although complete element distribution analysis is still under way, some qualitative similarities were noted. Distal non-meat parts such as phalanges (for both domestic and wild species) as well as meat rich upper limb bones like humeri were documented in all three contexts. All three contexts appear to include primary butchery waste, refuse from meals, and some fireplace cleaning materials. Overall, the two layers from G and the context from E appear to be midden deposits reflecting faunal refuse with a great degree of functional similarity. We would thus appear justified in making use of these contexts for preliminary comparisons of economic changes through time at this major site.

6.3 SPECIES PRESENT

Since 1996, the analysis of faunal material from Hofstaðir has identified many taxa both domestic and wild that were utilized throughout the history of the site. To date identified taxa include:

Domestic Mammals and Anthropophiles
Cattle (Bos taurus dom)
Sheep (Ovis aries dom)
Goat (Capra hircus dom)
Pig (Sus scrofa dom)
Horse (Equus caballus dom)
Cat (Felus domesticus)
Mouse (Mus musculus)

Wild Mammals
Seal (small seal, species indeterminate)
Arctic fox (Alopex lagopus)

Birds
Gulliemot (Uria sp.)
Duck (both Anas and Aythya sp)
Mallard (Anas platyr.)
Eider (Somateria mol.)
Ptarmigan (Lagopus mutus)
Bird indet. (more species will be added shortly)

Fish
Atlantic cod (Gadus morhua)
Haddock (Melanogr. aeglf.)
Saithe (Pollachis virens)
Flatfish
Trout (Salmo trutta)
Atlantic Salmon (Salmo salar)

Arctic Char (Salvelinus alpinus)

Mollusca
Mussel (M edulis)
Clam sp.
Gastropod sp.

Additional work is underway to further study the fish and bird material beyond the basic analyses presented in this report, and we expect to add species in the next report. Even this preliminary species list indicates use of a wide range of resource areas, from the lake and the upper Laxa near the site right down to the lower reaches of the Laxa and to the seacoast. This wide site catchment is of considerable importance to our understanding of site provisioning in the early settlement period.

6.4 FAUNAL CHANGE THROUGH TIME

An analysis of the various taxa present provides some insight into overall faunal resource utilization at Hofstaðir through time (Figure 6.3). The earliest material from context [0006hk], contains approximately 40% domesticate fauna (cattle, caprines, pig and horse) with the remainder being salmonid, gadid, and general unidentifiable fish species. Changes are noted when context [0004] is examined. A noticeable shift has occurred away from general domesticates toward more reliance upon wild species. An increase in percentages of the salmonid and general fish species is clear. Additionally, bird species of various types (fresh water, sea, and land birds) are recorded in significant numbers. Our only evidence of seal in these selected deposits was found in the [0004] context, though a few fragments of seal bone (including harp seal P. groenlandicus) were recovered from post AD 1477 contexts elsewhere on site. The [1144] context shows a clear reversal of the earlier trend noted in [0004] (with its increasing wild species content) as domestic mammals now dominate and wild species (including fish) drop in relative %. The overwhelming majority of all taxa recorded from the [1144] deposit represent domesticated animals. When a wild/domestic species ratio is calculated, the increased reliance upon wild species is clearly shown in the [0004] context (Figure 6.4). The earliest context reflects a nearly 1 to 1 ratio of wild to domestic species present. By the [0004] context, this ratio has changed to almost 5 wild for every 1 domestic fragment. The reversal of this trend is drastic in the [1144] context, with a wild domestic ratio near zero. [0004] material represents a general reliance upon wild species as well as a noticeable marine connection that is less pronounced in material from either of the other contexts. The presence of sea birds, Atlantic fish and seal all indicate connections with the coast. Preliminary analysis of the fish elements present by Dr. S. Perdikaris) indicates that no head bones except the cleithrum (often left in preserved fish) are present for any of the marine fish identified, and that the remains are consistent with the import of dried or salted prepared fish. By contrast, the salmonid (trout, char, and salmon) appear to be represented by whole skeletons.

Of special interest is Hofstaðir's aviafauna collection from all three contexts. Given its location near Lake Myvatn, which is famous for its diversity of breeding waterfowl, we were interested in the type and number of bird remains we would find. In the earliest context ([0006hk]) ptarmigan are the only identified bird species. In the [0004] context, ptarmigan are by far the most numerous species as well. Various aquatic birds (both inland and sea based) are present as well, although in small numbers. Identified species include Mallard and Guillemot.

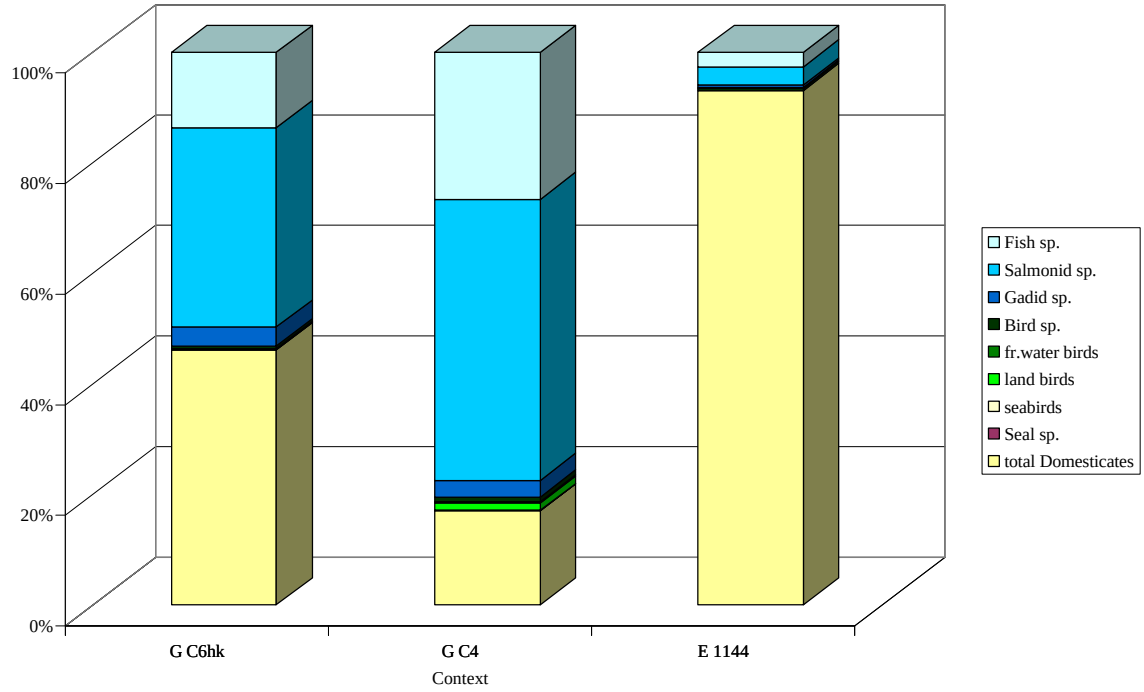

Figure 6.3 Major Taxa

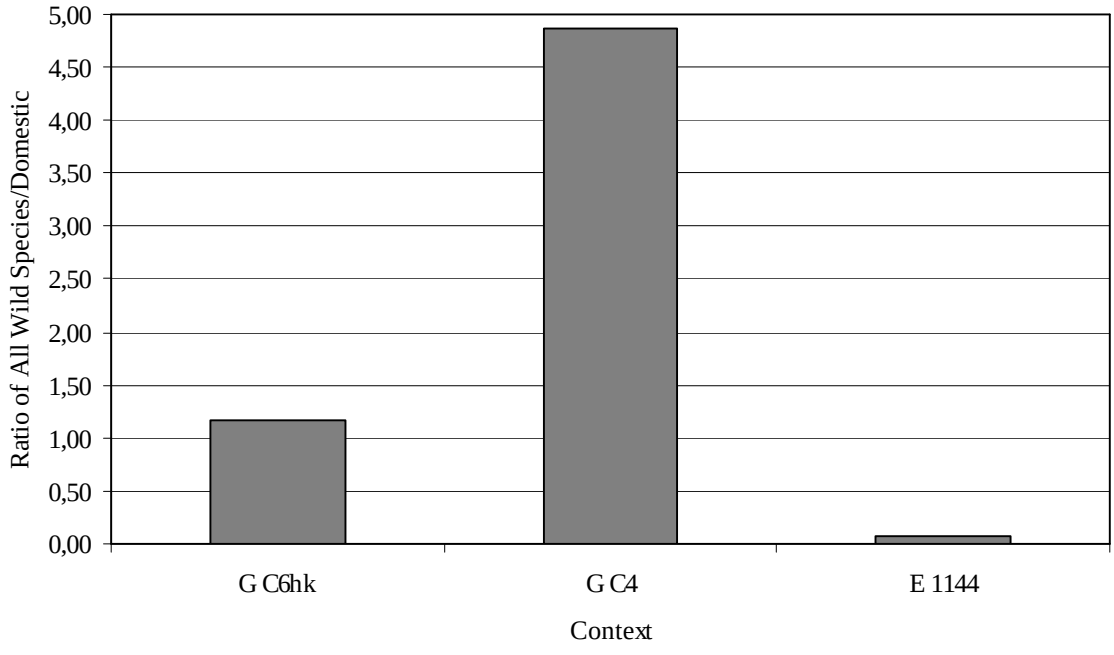

Figure 6.4 Wild/Domestic Ratio

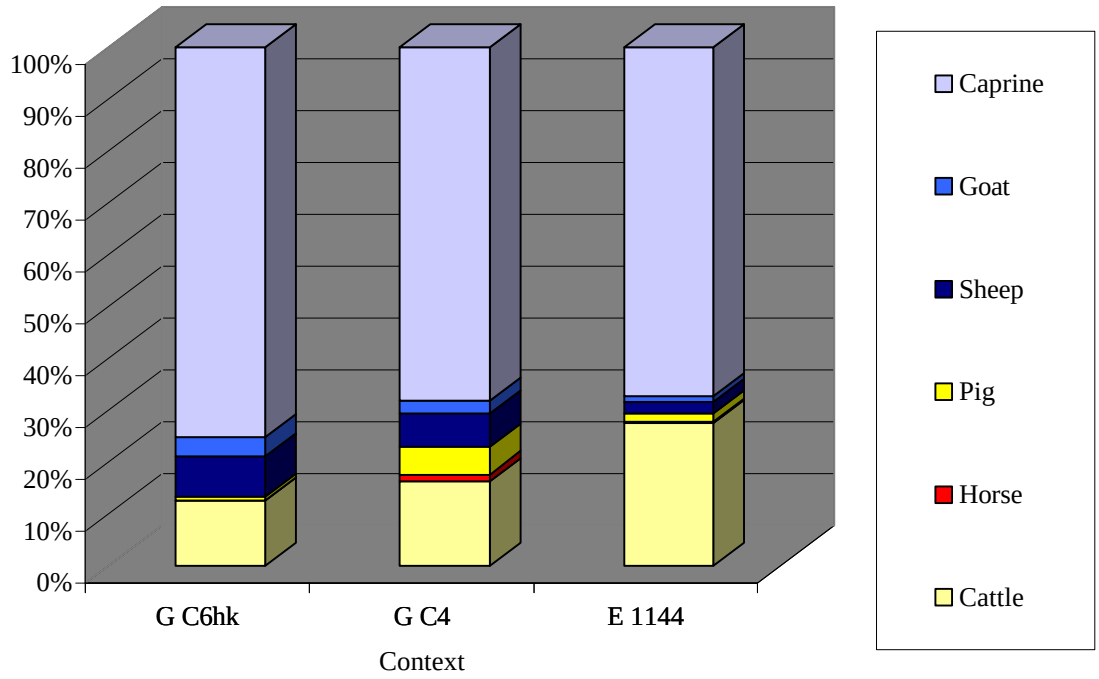

Figure 6.5 Domestic Mammals

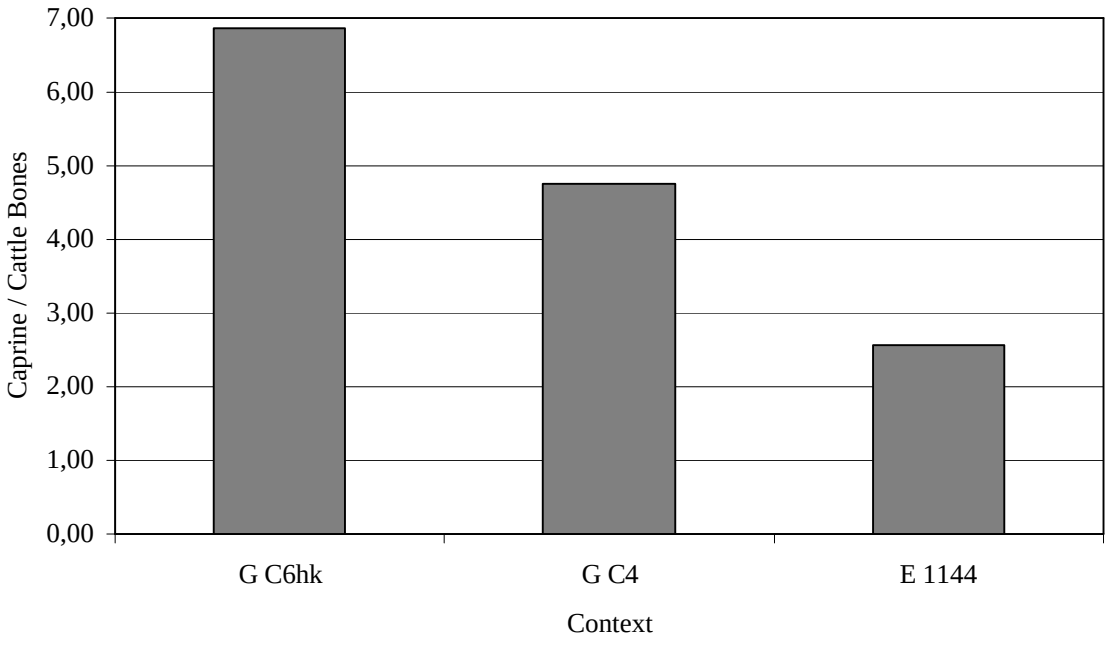

Figure 6.6 Caprine/Cattle Ratio

Ptarmigan were not only the most numerous bird species present but the most consistent with respect to skeletal elements represented. Almost all ptarmigan elements were either the tibiotarsus or tarsometatarsus lower leg bones. This suggests a butchery pattern of removing

the lower leg and feet, (which are low in useable meat or fat) before cooking, or preservation. In general, due to their low overall numbers, the ptarmigan remains most likely reflect opportunistic hunting in the general area. Ptarmigan are common to the Laxa River valley today and on the heaths on either side.

Unlike the pattern of use of wild species, the domesticates show a clear unidirectional trend over time (figure 6.5). Through the three time ranges believed to be represented by the various contexts, cattle gradually increase in proportion to caprines (both sheep and goats taken together). Cattle as a percentage of the total number of domesticates more than doubles from [0006hk] (with a percentage of 12 %) to [1144] (with a percentage of 27 %). Cattle appear to gradually increase relative to caprines, suggesting a gradual re-alignment of the roles of these two major domesticates. Additionally, some of the domesticate diversity that is represented in [0004] (pig and horse) is also reduced in the [1144] context as cattle percentages increase.

When a caprine to cattle ratio is created (figure 6.6), the increase in cattle over caprines becomes even more pronounced. In the [0006hk] context, there is 1 cow for every 6.8 caprine. In context [1144], the ratio has fallen to 1 cow for every 2.5 caprine. It is interesting to note that context [1144] is the deposit that represents the highest percentage of cattle both as a percentage of all taxa and as a percentage of all domesticates. Context [1144] is also the deposit that is believed to be contemporaneous with the great hall.

6.5 Discussion and the wider context

6.51 Domestic Mammals

A high percentage of cattle (of the domesticate total) has long been associated with higher status farms in the North Atlantic (McGovern 1992, Barrett 1997, Perdikaris 1998). Farm deposits with the majority of the domesticate remains being identified as cattle date back to Neolithic in Scandinavia (Jorgensen, 1977). The very high status Norwegian chieftain's farm of Aker is represented by domesticate faunal remains of which nearly 50% are cattle (Perdikaris 1990; Figure 6.7). Other farms believed to have been of high status in both southern Iceland (Tjarnargata 4 and Herjolfsdalur and Greenland (W51 and E17a (Amorosi 1996, McGovern et al 1993, McGovern et al 1996) are all represented by collections in which cattle comprise a minimum of approximately 30% of the domesticate total. By these numerical criteria the trend from [0006hk]- [1144] context suggest increasing status, but note that the middle ranking farm of Granastaðir in upper Eyjafjorður appears closely comparable in its cattle % to the [1144] context from the great hall. While the intensive sieving program at Hofstaðir has probably increased the relative % of smaller taxa (like caprines) relative to cattle by a few percentage points, the general similarity between Granastaðir and [1144] remains an issue for consideration and further investigation. It is probably too simplistic to attempt to directly read social status from any set bone percentage, especially when such measures are divorced from local environmental context and unsupported by other indicators of social or economic power. Given the profound climatic differences between north and south Iceland, and between Eyjafjord (today cattle rich) and Myvatnssveit (today virtually devoid of cattle), we may suspect that the same relative percentage of cattle may mean different things at different sites. This comparative issue may underline the need for a regional perspective, and for the sort of sustained work in a single region propsed by the FSí-NABO long term research plan. Comparisons with the newly discovered Sveigakot site may prove particularly illuminating, and we look forward to reporting these collections in the next interim report.

Similar intersite comparisons can be made by examining all major taxa present. Figure 6.8 highlights a tremendous variety in resource utilization between the sites (and in the case of Hofstaðir change over time in one site). The sites of Aker, Granastaðir, Hofstaðir ([1144] context) and Adabol all have 80% of their overall taxa represented by domesticated mammals. Other sites in Iceland represent various utilizations of available wild species. The sites from Southern Iceland are dominated by birds, while contexts [0006hk] and [0004] from Hofstaðir, have large percentages of salmonid fish species. Svalbard, from Northeast Iceland, has material very rich in fish species as well as smaller amounts of seal and bird. The Greenland sites offer yet more contrast with large amounts of caribou and seals present in all of the their collections.

While all arguments for regional context should be kept in mind, some generalizations emerge from these available comparative data. First, a relationship between sites representing early colonization and wild resource exploitation seems evident. Sites representing the first generations of pioneering settlement such as Tjarnargata 4, Herjolfsdalur and Hofstaðir (contexts [0006hk] and [0004]) are all rich in available wild species (note the high percentages of birds at the two southern sites). Sites representing the more stable period of the early Commonwealth (after ca AD 950), such as Granastaðir, Hofstaðir (context [1144]), and Adabol reflect a solid reliance upon domestication, as does the long established farm of Aker. The pattern at the coastal farm of Svalbarð somewhat pre-figures patterns of the late Commonwealth and Later Medieval periods in which marine fish become an increasingly major supplement to a developed farming economy.

One possible explanation for the variance in the representation of wild species from site to site could be due to strategies that would have allowed for maximum domesticate herd increases. An early temporary, reliance upon wild species could have allowed for vital domesticate herd increases in a given area by sparing both animals and milk production. As herds (both cattle and sheep) increased in size, more dairy produce could be directly consumed by humans and progressively more of the young could be utilized for meat, rather than heard expansion. Over time, this could have lead to reduced reliance upon wild species. Areas in which ideal herd maximization was not possible (whether due to climatic or resource limitations), an early reliance upon wild taxa could have been integrated into a more permanent provisioning strategy (as may have happened in Norse Greenland, and perhaps Svalbarð).

Such high variability among sites in wild resource utilization could be due to other factors as well. A large percentage of wild taxa could also be indicative of numerous provisioning networks as was possible with powerful chieftains. Additionally, such diverse provisioning strategies could also reflect solutions to temporary stress in established domesticate production due to various local environmental reasons. More multi-disciplinary research is clearly needed before we can fully understand the factors influencing the deposition of faunal material in the 9-11th centuries, and there is a clear need for the full integration of zooarchaeology with landscape and architectural investigation.

Hofstaðir and its rich, well preserved midden deposits is proving to be a valuable key in understanding some of the dynamics in farm stocking and provisioning in the first generations of settlement, and the nature of social and economic status markers in N Icelandic archaeology. Thanks to the direction of the Institute of Archaeology, Iceland, excavation techniques suited to systematic recovery of a high-quality faunal sample have allowed for extremely high-resolution investigations that will shortly replace this series of temporal vignettes with a continuous record of economic and environmental change.

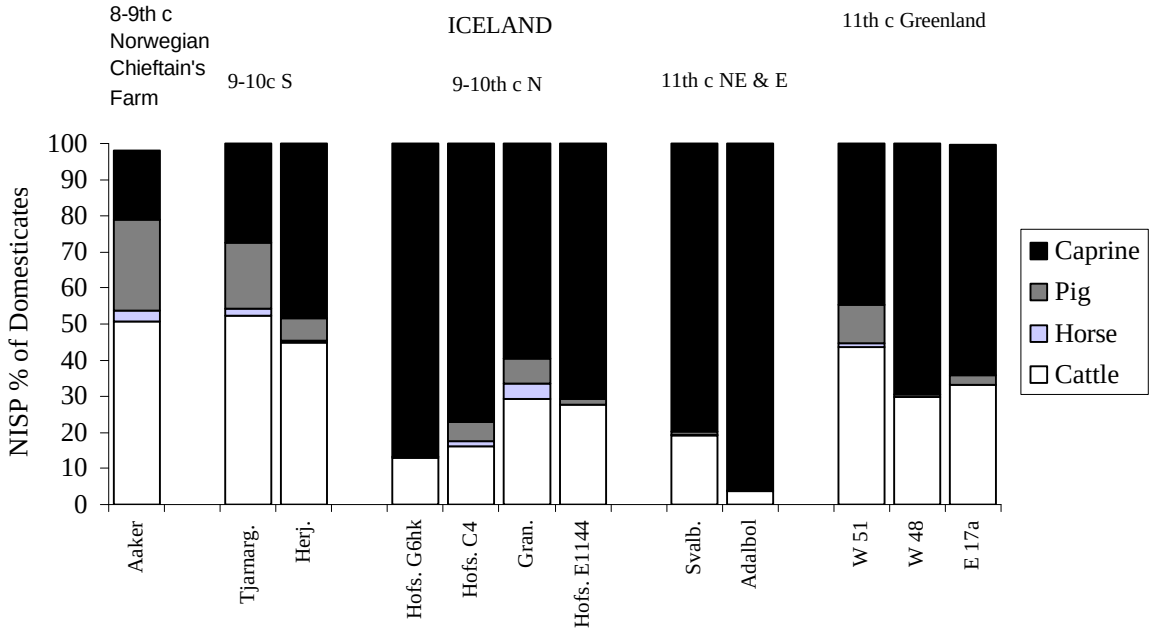

Figure 6.7 9th-early 12th century Major Domesticated Mammals from various sites

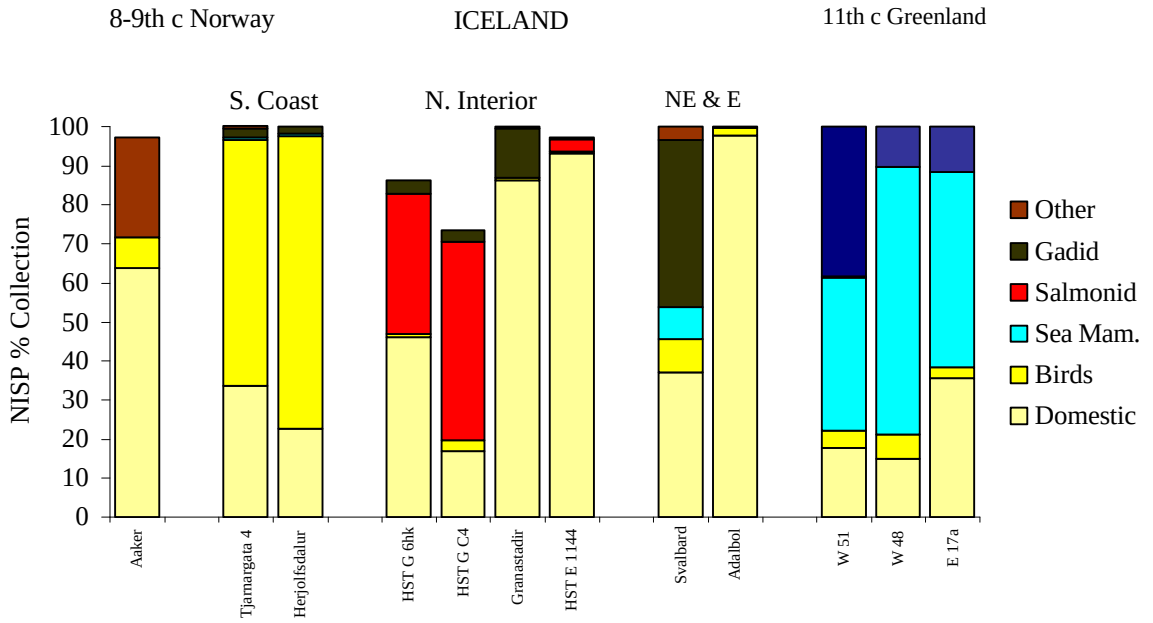

Figure 6.8 Major Taxa from various sites

6.6 FUTURE RESEARCH GOALS

A primary goal is to increase the temporal resolution and continuity of our Hofstaðir midden (Area G) analysis by completing first stage analysis of all the layers. As more of the identified strata from the midden are fully analyzed and dated, it is hoped that more can be learned about possible stocking changes over the first few generations of settlement at Hofstaðir. Key concerns are the changes in domesticate production (cattle/caprine ratio) and the use of wild

species through time. We will also move beyond the first stage analysis, adding age assessment, systematic butchery study, metrical, and incremental studies to the basic work of species identification.

The role of landscape change is a concern of future research as well. Recently developed techniques by Ingrid Mainland (1997, 1998) which use dental microwear patterns in an effort to determine the presence of soil erosion in the grazing environment of various domesticates, will be used in the study of Hofstaðir's cattle and caprine remains. Only with an understanding of the various landscape variables at play during the settlement period, can we begin to fully understand the changes noted in the faunal deposits. Mainland's work on the Hofstaðir material will be an initial step in attempting to gain some insight into the early physical environment of Hofstaðir.

Our understanding of the relationship between cattle (as a percentage of the domesticate total) and status is very limited at this time. The importance of cattle and the overall expense required to keep them in a region that, today, is a major sheep production area, must have been primary, although competing concerns in the hiearchical chiefly society of early Iceland. We hope to study this dynamic relationship between society and environment by expanding our study to the regional scale. With the newly discovered and partially excavated 10^{th} c inland site of Sveigakot, we hope to increase our knowledge of the complex issues of domesticate production in rapidly changing natural environments.

Table 6.1 List of Bones from 1999

Catalogue No.	Area	Context	Weight
99-1	D	cleaning	< 25g
99-2	D	002	50g
99-3	D	004	25g
99-4	D	062	25g
99-5	D	064	25g
99-6	D	546	25g
99-7	Z	1503	-
99-8	Z	cleaning	250g
99-9	Z	001	3200g
99-10	Z	084	100g
99-11	Z	1500	< 25g
99-12	Z	1503	425g
99-13	Z	1506	25g
99-14	Z	1505	25g
99-15	Z	1506	75g
99-16	Z	1507	50g
99-17	Z	1508	150g
99-18	Z	1509	< 25g
99-19	Z	1511	100g
99-20	Z	1512	625g
99-21	Z	1515	< 25g
99-22	Z	1522	125g
99-23	G	001	50g
99-24	G	004	1675g
99-25	G	004	100g
99-26	G	004	< 25g
99-27	G	004	225g
99-28	G	004	100g
99-29	G	004	1250g
99-30	G	004-007	325g
99-31	G	008	2200g
99-32	G	013	< 25g
99-33	G	015	50g
99-34	G	016	25g
99-35	G	700	25g
99-36	G	1908	25g
99-37	G	?	700g
99-38	A	100	3350g
99-39	A	107	9350g
99-40	A	001	< 25g
99-41	A	115	1225g
99-42	A	121	1500g
99-43	A	139	100g
99-44	A	153	200g
99-45	A	157	100g
99-46	A	158	400g
99-47	AB	001	225g
99-48	AB	002	125g
99-49	AB	128	75g
99-50	AB	129	< 25g
99-51	AB	131	< 25g
99-52	AB	132	< 25g
99-53	AB	132B	25g
99-54	AB	133	< 25g
99-55	AB	134	150
99-56	AB	135	175g
99-57	AB	136	1375g
99-58	AB	137	75g
99-59	AB	138	1025g
99-60	AB	154	425g
99-61	AB	155	325g
99-62	AB	156	100g
99-63	AB	159	625g
99-64	AB	169	25g
99-65	AB	170	50g
99-66	AB	171	75g
99-67	AB	173	< 25g
99-68	AB	135	725g
99-69	AB	159	1250g
99-70	AB	159	1425g
99-71	AB	159	550g
99-72	AB	159	450g
99-73	AB	159	425g
99-74	AB	159	225g
99-75	AB	159	175g
99-76	G	008	1325g
99-77	G	008	575g
99-78	G	008f	400g
99-79	G	009	< 25g
99-80	A	Unstrat	75g
99-81	A	178	< 25g
99-82	A	191	175g
99-83	A	185	50g
99-84	A	109	< 25g
99-85	A	182	50g
99-86	A	193	< 25g
99-87	A	196	375g
99-88	A	016	50g
99-89	A	100	75g
99-90	Z	1529	50g
99-91	Z	1533	< 25g
99-92	Z	1514	150g
99-93	Z	1518	25g
99-94	Z	1537	100g
99-95	Z	1536	350g
99-96	Z	1534	200g
99-97	Z	1528	25g
99-98	Z	1522	25g
99-99	Z	1523	50g
99-100	AB	154	200g
99-101	AB	187	50g
99-102	AB	171	50g
99-103	AB	186	25g
99-104	AB	192	125g
99-105	AB	183	< 25g
99-106	AB	197	25g

99-107	AB	203	50g
99-108	AB	199	< 25g
99-109	AB	197	< 25g
99-110	AB	171	450g
99-111	AB	172B	1700g
99-112	AB	154	75g
99-113	AB	190	75g
99-114	AB	154	250g
99-115	AB	171/159	325g
99-116	AB	160	50g
99-117	AB	181	< 25g
99-118	AB	136	< 25g
99-119	AB	172A	125g
99-120	AB	177	< 25g
99-121	AB	171	75g
99-122	AB	155	225g
99-123	AB	155	50g
99-124	AB	179	< 25g
99-125	AB	155	175g
99-126	AB	160	25g
99-127	AB	194	100g
99-128	AB	155B	25g
99-129	AB	172	125g
99-130	AB	159	150g
99-131	Z	1528	< 25g
99-132	AB	172	200g
99-133	AB	172?	125g
99-134	AB	001	375g

NB. Note this catalogue list is separate from the main finds catalogue.

7. BOTANICAL REMAINS (G. GUÐMUNDSSON)

A statement on the current state of processing and analysis of the bulk samples and botanical remains will be forthcoming. A list of samples taken in 1999 is given below:

Sample No.	Area	Context	Details
S-99-01	G	008, 009	Micromorphology sample from southwest quad, east section
S-99-02	G	008, 009	Micromorphology sample from southwest quad, east section
S-99-03	G	008, 009	Micromorphology sample from southwest quad, east section
S-99-04	G	008, 009	Micromorphology sample from northeast quad, south section
S-99-05	G	008, 009	Micromorphology sample from northeaast quad, south section
S-99-06	G	008	Bulk soil sample of dark grey sand and ash lens
S-99-07	G	008, 009	Micromorphology sample from northeast quad, west section
S-99-08	G	008, 009	Micromorphology sample from northeast quad, west section
S-99-09	AB	172	Charcoal rich--bulk sample (core of)
S-99-10	G	004	Charcoal
S-99-11	Z	001	Charcoal
S-99-12	AB	130	Charcoal
S-99-13	AB	159	Southwest quadrant charcoal
S-99-14	AB	134	Charcoal
S-99-15	AB	136	Charcoal "internal"
S-99-16	G	013	Charcoal
S-99-17	AB	154	Charcoal
S-99-18	AB	155	Charcoal northeast quadrant
S-99-19	AB	155	Charcoal southwest quadrant
S-99-20	AB	138	Charcoal
S-99-21	AB	136	Charcaol northwest quadrant
S-99-22	AB	136	Charcoal northeast quadrant
S-99-23	AB	136	Charcoal southeast quadrant
S-99-24	AB	171	Charcoal northeast quadrant
S-99-25	AB	181	Charcoal
S-99-26	AB	190	Charcoal rich mixed layer
S-99-27	AB	199	Charcoal rich mixed layer
S-99-28	AB	171	Charcoal
S-99-29	G	008	Charcoal
S-99-30	AB	171	Charcoal large sample
S-99-31	AB	171	Charcoal--large sample from southeast quadrant
S-99-32	AB	194	Charcoal
S-99-33	G	004	Charcoal
S-99-34	A	196	Charcoal
S-99-35	A	193	Charcoal
S-99-36	AB	154	Charcoal from sheep burial
S-99-37	AB	155	Charcoal from southeast quadrant
S-99-38	AB	160	Charcoal from northwest quadrant
S-99-39	AB	171	Charcoal from northwest quadrant
S-99-40	AB	171	Charcoal from northwest quadrant
S-99-41	AB	187	Charcoal from northwest quadrant
S-99-42	G	004	Charcoal
S-99-43	AB	177	Charcoal
S-99-44	AB	155B	Charcoal from northwest quadrant
S-99-45	AB	172B	Charcoal
S-99-46	AB	155	Charcoal from southeast quadrant
S-99-47	AB	001	Charcoal
S-99-48	AB	171	Charcoal from southeast quadrant
S-99-49	G	008	Charcoal from southeast quadrant
S-99-50	AB	197	Charcoal
S-99-51	AB	155	Charcoal from northwest quadrant
S-99-52	AB	159	Charcoal from northwest quadrant
S-99-53	AB	160	Charcoal from northwest quadrant

S-99-54	Z	1522	Charcoal
S-99-55	AB	177	Charcoal
S-99-56	AB	159	Charcoal from northwest quadrant
S-99-57	A	196	Bulk soil sample for flotation
S-99-58	Z	1530	Chest cavity--3 bags
S-99-59	G	008	Bulk soil sample of ash
S-99-60	G	004	Bulk soil sample from southeast corner for flotation
S-99-61	G	008f	Bulk soil sample for flotation
S-99-62	D	545	Bulk soil sample of hay layer for flotation
S-99-63	G	008	Bulk soil sample for flotation
S-99-64	AB	190	Charcoal
S-99-65	AB	192	Stones, waterborne?
S-99-66	AB	194	Charcoal
S-99-67	G	004	Stones, waterborne?
S-99-68	G	016	Stones

8. INSECT REMAINS (N. PIQUÉ)

Neus Piqué Baella (Dept. of Animal Biology, Vegetal Biology and Ecology, University of Barcelona, Bellaterra, Spain)

In order to enrich the archaeological study, a palaeoentomological analysis of selected deposits was carried out in some areas of the site. The soil samples were taken mainly from areas D [545] and G [0008c]; a small sample from area A/B was taken as well but only from the context [172a]. These are the areas where we expected to find a higher concentration of insect remains, especially in Area D, where large amounts of organic material (mainly hay) were previously found. The soil samples were treated using the kerosene-water technique (cf. Coope 1985) in order to obtain the maximum amount of insect material.

The assemblage of insect cuticles obtained in Area D [545] and G [0008c] was rather small, and the rest of the areas analyzed had no remains at all. About the 95% of the assemblage is made up of legs and some thorax pieces from insects which, under magnification, have the same shape and proportional size. This could mean that all these similar pieces come from the same group of insects. The rest of the assemblage in Area D contains a couple of flies and the head of a beetle, probably from the Curculinidae family. Some mollusca remains were found in Area G as well, and they were later identified as fish parasites.

There are some hypothesis which would explain the presence or absence of the insect groups found at Hofstaðir. First, the head found in the hay-barn (Area D) would probably be part of a beetle from the Curculinidae family. There are many beetle species related to hay-barns, most of these species are included in this family, and they occur in a large number. But despite this fact, we did not find more individuals in the soil samples from Area D. Whether the insect bodies are not well preserved at the site or if the group is not part of the background fauna in Area D is something we do not know yet. The flies from Area D although well-preserved, do not seem to have any relation with the stored hay.

Secondly, the rest of the insect material (small legs and thorax pieces), although the most abundant, is very difficult to identify. The legs found are small, strong and quite thick which suggests that would probably belong to an ectoparasite instead of a curculinidae beetle. The ectoparasites from domestic animals are very cosmopolitan species and are always present at farms. This would suggest that domestic animals, for instance sheep, could have been kept for a long time in Area D as well.

Figure 8.1 Dorsal view of a head of a beetle

Figure 8.2 Insect legs recovered from Area D

Figure 8.3 Thorax elements from an insect

Figure 8.4 Mollusca

Figure 8.5 Two legs from two different insect species (fungal spore to the right)

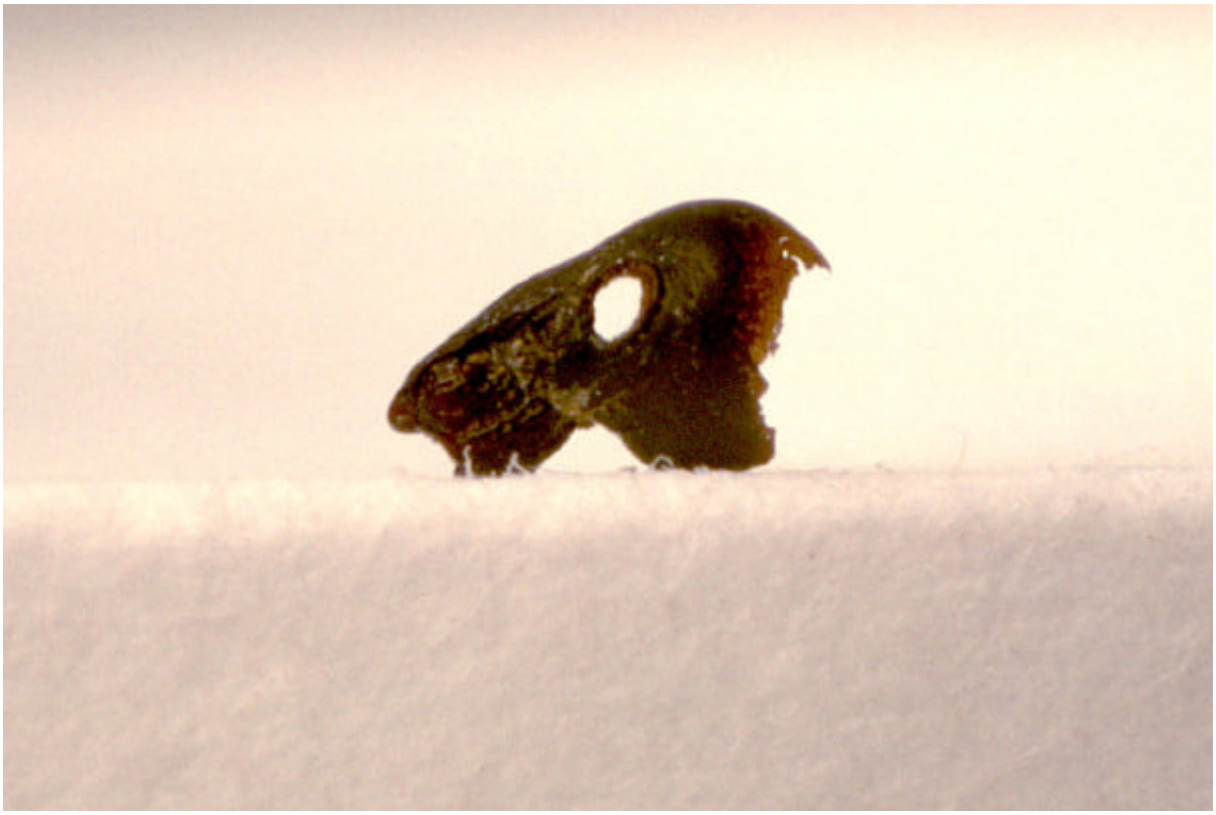

Figure 8.6 Head of a Beetle

9. FINDS (J. BREDENBERG)

J. Bredenberg *(Fornleifastofnun Íslands, Reykjavik, Iceland)*

9.1 INTRODUCTION

The 1999 excavations at Hofstaðir resulted in a relatively large collection of finds compared to previous years, due to an extension of excavated areas and a larger team of archaeologists. An interim finds catalogue was set up on site, in which finds were numbered successively as they were brought in from the field. Finds were as far as possible separated by material, but mostly not by individual object, objects of similar type from the same context (e.g. pottery) therefore sharing the same finds number. During post-excavation processing, a new catalogue was established which also incorporated the finds from previous seasons except for 1996. To create a consistent, accessible system of finds cataloguing all finds were sorted into material categories, type of objects, areas and contexts, and subsequently re-numbered. Finds have been numbered by individual object as far as possible and so that material categories are kept together, while each area has its own series of numbers with contexts numbered in an ascending order. Previously there has been some inconsistency in catalogueing slag, sometimes as samples, other times as finds; all slag from the sampling list was transferred and numbered as finds. Finds from all the years of excavation, 1995-1999, were included in the analysis.

The majority of finds, just more than a half, come from 19th and 20th century contexts and these will be referred to as modern. The other two main periods are Medieval to Post-Medieval and Viking/Norse. The material culture varies quite a lot over time and periods will be dealt with separately. It must be noted that in some cases, earlier material has been redeposited in later contexts.

9.2 THE VIKING PERIOD

9.21 Domestic Objects

Domestic material was not very abundant in the Viking period levels but importantly provided the most complete and well-preserved examples of all finds of this date. With some exceptions, all objects were related to textile working. Among them four loom weights with natural holes, and six stone spindle-whorls, two Type A, two Type B and one Type C, of varying completeness. Other objects included eight knives/parts of knives, of which three were whittle-tanged, and nine whetstone fragments, all intensively used.

9.22 Industrial waste

There was extensive evidence of industrial activities at Hofstaðir, slag being the dominating find category of the Viking period, 68% of the total weight of finds. Most common was iron slag, with smaller quantities of possible glass slag and unknown types. The vast majority of slag was found in area G.

9.23 Personal

Personal objects were fairly scarce but in return all were very well preserved. Beads or fragments of beads were the most numerous, eleven in total, three amber, one fired clay and seven glass. Other dress-accessories included: two buckles, one ring and one crampon, all of

iron. Five frail fragments of textile may be remains of clothing. Perhaps the finest of all the personal objects was a bone comb and a pair of small, copper alloy tweezers.

9.24 Structural

By weight, structural remains were the second largest group of finds after slag. In terms of count, however, structural objects were by far the most common type of find. The vast majority of objects were different types of nails (see below). With the exception of a copper alloy hook, all the material was of iron including seven fittings, five clench bolts (of which one had a diamond shaped rove and one with rectangular rove), two staples, one u-shaped and one rectangular and three studs.

9.25 Wood

Wood was retrieved from one area only and originally as one piece of a board or plank. *In situ*, it was very poorly preserved and only a few reasonably well preserved fragments have been kept as a sample. Although given a separate finds category for storage reasons, in this particular case, the wood can with confidence be associated with structural remains.

9.26 Unknown

An over-representation of metal, i.e. iron, among the unknown material, may well be badly degraded parts of structural objects. There were also a number of stones of which some appeared to have been waterborne and therefore must have been brought onto the site. Also of interest was the presence of two flint flakes and their presence probably indicates the sharpening of a flint tool(s). Flint is not indigenous to Iceland and these examples may come from Denmark. In relation to this, the presence of other stone tool processing also appears to have taken place, one flake of worked obsidian was found. Obsidian (*Hrafntinna*) is native to Iceland, the closest source to Hofstaðir being Hrafntinnuhryggur, just south of Krafla, which is *c*. 23km north-east of the site (Sæmundsson & Gunnlaugsson 1999: 67). Fragments of Jasper (*Jaspis*) have also been recovered, which comes from Hestfjall in Borgarfjördur, (W. Iceland), (Sæmundsson & Gunnlaugsson 1999: 150-1)

Area	**Domestic**	**Personal**	**Structural**	**Unknown**	**Grand Total**
A	0	1	2	1	*4*
AB	2	2	6	14	*26*
D	2	0	2	4	*8*
E	4	0	9	3	*16*
G	32	19	55	41	*223*
Grand Total	*40*	*22*	*74*	*63*	*277*

Table 9.1 Count of objects of the Viking period, all areas.

Area	Domestic	Industrial waste	Personal	Structural	Wood	Unknown	Grand Total
A	0	0	2	6	0	4	*12*
AB	5	1165	0	17	52	64	*1303*
D	492	46	0	8	0	0	*546*
E	43	9	0	15	0	0	*67*
G	1853	6031	58	207	0	603	*8752*
Grand Total	*2393*	*7251*	*60*	*253*	*52*	*671*	*10680*

Table 9.2 Weight (in grammes) of material Viking period, all areas.

9.3 MEDIEVAL/POST-MEDIEVAL PERIOD

One trench excavated, Area Z, contained finds of the Medieval to Post-Medieval period. Domestic objects were modest indeed, one glass bead and one copper alloy buckle. Domestics included one whetstone fragment, smoothed from use, a few fragments of pottery and half a pair of scissors. Structural objects, in particular nails, were the most frequent finds.

Domestic	Personal	Structural	Unknown	Grand Total
7	1	31	11	*49*

Table 9.3 Count of finds from the Medieval/Post-Medieval Period, Area Z.

Domestic	Industrial waste	Personal	Structural	Unknown	Grand Total
93	6	3	87	10	*199*

Table 9.4 Total weight (in grammes) of finds from the Medieval/Post-Medieval Period, Area Z.

9.4 MODERN PERIOD (19TH-20TH CENTURY)

9.41 Domestic objects

The most prominent find of the Modern period was the large amount of fragmented pottery (see Tables 5 & 6), both in terms of weight and quantity. A considerable amount of these were large enough to classify and typical vessels included bowls, cups, plates and other kitchen ware. Glass fragments were also frequent, most commonly from bottles. Domestic metal finds were moderately common; a few fragments from horse shoes, one possible spiked candle holder, two scissors, five knives (one scale-tanged with wooden handle and one whittle-tanged), and a spade handle with wood still attached. A number of objects associated with textile working was also present; one loom weight, one possible bone needle case dressed in some type of felt fabric and two spindle whorls, one Type A and one Type B (see below). The

presence of the latter might well be related to some intermixing with earlier levels; alternatively these objects remained in use into modern periods. Whetstones were relatively frequent, twelve fragments in total, all with signs of intensive use.

9.42 Industrial Objects

Industrial objects were significantly scarce; one triangular sectioned file/rasp, two cold sets/chisels and four parts of unidentified tools, all of iron.

9.43 Industrial waste

A small quantity (53g) of slag was collected, which may be redeposited from previous contexts.

9.44 Personal Objects

Of the personal objects, again not a very large collection, most were dress-accessories or direct remains of clothing; two buckles, three buttons, one fastening, a small rumbler bell and five fragments of textile. Two small finials, of which one was a pen end and one possible part of a key.

9.45 Structural

The structural material was the second largest group of finds after the domestic objects. With the exception of a few fragments of window glass, all the structural remains were of metal, mainly iron and less common copper-alloy. The vast majority of objects consisted of different types of nails (see below), tacks, bolts, rivets, studs and spikes, followed closely by fittings, straps and plating. Only three staples were retrieved, two u-shaped, one rectangular, one small hook, and three clench-bolts with oval-, circular- and rectangular roves respectively. The latter are commonly associated with boat construction, but more generally are used in a range of wooden stave-constructed artefacts (e.g. barrels).

9.46 Wood

Although wood in the modern layers was reasonably well preserved it was very fragmented and while in some cases they appeared to have been worked, it was not possible to establish any kind of function, but some fragments may have come from structral elements.

9.47 Unknown

Objects that were too fragmented or corroded were classified as unknown. These consisted in a large part of metals, i.e. iron, and it is very probable that they are badly degraded parts of structural elements.

Area	Domestic	Industrial	Personal	Structural	Wood	Unknown	Grand Total
A	298	2	12	106	26	16	*460*
AB	6	1	0	4	0	4	*15*
D	6	1	0	4	0	0	*10*
E	5	1	1	3	0	1	*11*
G	3	0	0	0	0	0	*3*
Z	51	2	3	69	5	26	*155*
Grand Total	*369*	*5*	*16*	*186*	*31*	*47*	*654*

Table 9.5 Quantity of objects 19h-20th century, all areas.

Area	Domestic	Industrial	Industrial waste	Personal	Structural	Wood	Unknown	Grand Total
A	1645	66	51	38	948	174	63	*2985*
AB	224	26	0	0	90	0	2	*342*
D	102	26	0	0	40	0	0	*142*
E	35	14	2	9	3	0	7	*70*
G	4	0	0	0	0	0	0	*4*
Z	3177	214	0	17	465	20	330	*4203*
Grand Total	*5187*	*300*	*53*	*64*	*1546*	*194*	*402*	*7746*

Table 9.6 Weight (in grammes) of finds 19th-20th century, all areas.

9.5 DISCUSSION

At a coarse level, the finds pattern can be said to differ quite dramatically between the two main periods so far excavated at Hofstaðir. The Viking period is characterised by a large amount of slag and structural remains, while in the 19th and 20th centuries the emphasis is on domestic objects, i.e. pottery. However, there were some similarities. Both periods presented modest collections of personal objects, and in both periods structural objects were excessively common. The comparison is perhaps not too excessive either, as both assemblages derive primarily from midden deposits in an abandoned structure, A1 in the case of the modern period and G in the case of the Viking phase. The main difference can perhaps be said to lie in the presence of pottery in the modern period and its absence in the Viking period, a point which may highlight different patterns of foodways.

To conclude, a brief summary of major objects will be presented, outlining typological variability and functional characteristics; this is very much a preliminary statement on the finds from Hofstaðir and will be extended and revised in the course of further work and analysis.

9.51 Spindle-whorls

Numbers of spindle-whorls are modest at Hofstaðir, all in all eight have been retrieved since 1995, of which four are complete and four fragmented. However, they proved to make one of

the easier groups to analyse, being very well preserved and typically shaped. The most common material is stone, primarily steatite and then sandstone, and only one ceramic spindle whorl has been found. At least three different types could be extinguished among them (fig. 9.1), those from Bryggen being used as comparative material (Øye 1988: 37-42), and supplied excellent analogies. All spindle-whorls at Hofstaðir had conical or funnel-shaped holes with the maximum diameter at the base.

Type A: (Bryggens type F) Flat on top and underneath, round with slightly convex sides.

Type B: (Bryggens type A) Hemispherical with a flat base and max. diameter at base.

Type C: (Bryggens type D) Lentoid or biconical in cross-section. The point of max. diameter is approx. through the middle.

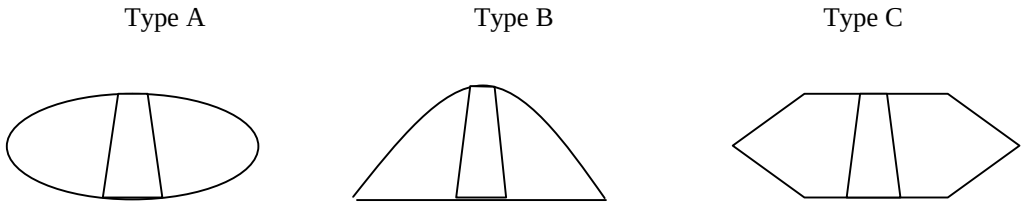

Figure 9.1 Types of spindle-whorl

Find no.	Context	Area	Type	Material	Diameter (mm)	Hole (mm)	Height (mm)	Weight (g)	Complete
95-001	-	G	A	Sandstone	37	10-12	17	35	Whole
96-007	0005a	G		Stone					
97-037	015c	D	B	Clay	38		24	15	Part
98-115	1066	E	A	Sandstone	36	10	17.5	19	Part
98-120	006n	G	A	Steatite			17	13	Part
99-263	008	G	B	Steatite	35	10-13	22	40	Part
99-264	008 NE	G	C	Steatite	39	11	14	18	Part
99-275	1514	Z	B	Steatite	30	10-13	18.5	26	Whole

Table 9.7. Summary of spindle-whorls

Table 9.7 gives summary data on the spindle-whorls recovered so far; types A and B, are found in all periods at Bryggen (i.e 12th to 15th century), but type C was not common. In Øye´s comparison with Viking sites, all types were represented, but type B (and to lesser extent, C) were more common. She does however state that Viking examples are heavier (but provides no statistics). The modal weights from Bryggen were 11, 15, 18 and 27g for all types and comparing these to the Hoftsaðir examples, the latter are clearly heavier on the whole. Additionally, the size of hole at Bryggen, while ranging between 5 and 15mm, averaged 6-8mm and those from Hofstaðir are again at the larger end of this scale. The larger size and weight of the Hofstaðir (and more generally Viking) spindle-whorls relates to the thickness of yarn being spun - fine yarn needs a faster spin and thus lighter weights. For example, cotton is associated with 3-5g spindle-whorls while wool with 30-35g. 50g spindle-whorls are used for

plying the yarn (Øye 1988: 54-5; based on Linder´s work). The heavier spindle-whorls from Hoftsaðir can then be tentatively (if uncontentiously) associated with wool spinning and plying.

9.52 Loomweights

Several weights for the warp on upright looms were recovered. The heaviness of the weight is critical to the tautness of warp and therefore the final product, although weights on the same loom do not need to be of same weight, indeed one can use more than one thread per weight to counterbalance differences (Øye 1988: 70). Modal weights from Bryggen lay between 400 and 900g and those from Hoftsaðir are comparable (Table 9.8). The main feature of the Hofstaðir examples is that they are all from natural stones with minimal or no working.

Find no.	Context	Area	Material	Weight	Hole
98-109	016	A	Basalt?	181	Partially worked
98-113	062	D	Basalt?	477	Unworked
99-266	008 SW	G	Basalt?	564	Unworked
99-267	008 SW	G	Basalt?	334	Unworked
99-269	013	G	Basalt?	740	3 partially drilled?

Table 9.8. Summary of loomweights

9.53 Pins

Only a handful of examples have been recovered so far. Of these, four are bone pins, two of which (<98-127> and <99-278>) have elaborately carved heads comparable to Type F in the Bryggen typology (Øye 1988: 86). These 'pins' may cover a variety of functions such as textile production (e.g. needles, distaffs, pin beaters), as awls/bodkins or as fasteners. Bryggen type F however were not considered as used for sewing, knitting or netting, but rather as bodkins, distaffs and pin beaters - the long length of the Hofstaðir examples probably discounts their use as bodkins and the most likely is that they were used as distaffs or fasteners. Of the other examples, <99-186>, being eyed, is almost certainly a needle.

Finds No.	Context	Area	Qty	Material Category	Material Type	Dimensions (mm)	Weight (g)	Notes
99-186	1512	Z	1	Metal	Fe	56.5 x 3.5	0	Broad eyed. Tip broken.
98-125	1136	E	1	Bone		88 x 5x 3.5	0	Tip and head broken.
98-127	005a	G	1	Bone		61x 6; arms 15	3	Head broken, 2 arms poss. originally 4. Tip broken. Polished.
98-128	007b	G	1	Bone		73 x 5x 5	0	Head and tip broken. Polished..
99-278	171 NWq	AB	1	Bone		82.5 x 4.5	2	Axe shaped or poss. cross shaped w. broken head. Carved patterns on both faces of arm, geometrical pattern.
99-074	136 NE	AB	1	Metal	Cu alloy	26 x 4	3	

Table 9.9 Summary of Pins

9.54 Knives and Scissors

Quite a few examples of knife blades have now been recovered and where known, most are whittle-tanged; the only example of a scale-tanged knife comes from a modern context as would be expected.

Finds No.	Context	Area	Qty	Type	Dimensions	Weight (g)	Notes
96-022	0005a	G	1	-	90 x 2 0x 5	-	-
97-007	004	G	1	-	68 x 22.5x 4	5	Slightly curved blade, blade and tang broken.
97-011	006d	G	1	Whittle-tanged	95 x 25 x 4.5	8	Bone frag. attached to blade.
98-002	100	A	1		104 x 17.5 x 3	18	Blade bent, tang broken.
98-003	100	A	1	Scale-tanged	120 x 3 thick/handle 92 x 19.5 x 12	38	With moulded bolster, wooden handle and cu alloy rivets (3). Blade broken.
98-026	1156	E	1	Whittle-tanged	133 x 12 x 8	16	-
98-049	006d	G	1	-	105 x 10 x 4	12	Tang missing.
98-054	006f	G	1	-	72.5 x 13 x 4	9	Pointed + sharp blade.
99-170	1503	Z	1	Whittle-tanged	87 long/blade 23 x 3/tang 10 x 5.5	18	-
99-195	1522	Z	1	-	90 x 14.5 x 5	21	Slightly curved + broken blade. Blunt tip. No tang.
98-017	1063	E	1	-	34 x 19 x 3	8	Tip pointed, blade broken.
99-030	107	A	1	-	21x 7.5, 19x 3	18	Curved blade.
97-009	005b	G	1	Whittle-tanged	56 x 19.5 x 2	3	-

Table 9.10 Summary of Knives

Three examples of scissors have been found, all from post-Medieval contexts. Of the two more complete examples, both are of a similar size and would be catgorised as general household scissors.

Finds No.	Context	Area	Qty	Dimensions (mm)	Weight (g)	Notes
99-013	107	A	1	115 long/blade 3 thick	8	1 arm w. centrally set fingerloop + slender sharp blade and shaped stem. Bent and worn.
99-014	107	A	1	29x21.5	2	Fingerloop eccentrically set on broken stem.
99-229	1538	Z	1	148 long/blade 18.5 wide 4 thick	30	Scissor arm w. centrally set, broken finger loop.

Table 9.11 Summary of scissors

9.55 Whetstones/Hones

A large number of whetstones have been recovered so far, most fragmentary. Many have drilled holes so they could be tied to the belt. All are in schist, imported probably from Norway and come from all periods.

Finds No.	Context	Area	Qty	Stone	Dimensions	Weight (g)	Notes
96-048	0006b	G	1	Schist	60 x 20 x 10	-	-

97-030	-	D	1	Schist	44 x 24x 10.5	23	End piece, smoothed through use on 3 faces, dark grey.
97-031	016	D	1	Schist	35.5 x 28 x 10	18	End piece w. partially drilled hole in one face, all faces smoothed. Dark grey.
97-032	005b	G	1	Schist	37.5 x 19.5 x 6.5	6	Longitudinally split, 1 smoothed face. Dark grey.
97-033	006k	G	1	Schist	60.5 x 19 x 9	12	Longitudinally split, no smoothed faces. Prob. mid. frag. Dark grey.
98-108	016	A	1	Schist	46 x 9 x 6	3	Split longitudinally, one face smoothed from use. Dark grey w. reddish tint.
98-110	100	A	1	Schist	53 x 16.5 x 9	11	End piece, split longitudinally, one face smoothed. V. light yellowish grey.
98-112	107	A	1	Schist	78 x 19 x 14	36	Prob. end piece, split longitudinally, one face smoothed. Yellowish grey.
98-114	1002	E	1	Schist	70 x 9 x 8.5	8	Longitudinally split, two faces smoothed + w. point sharpening grooves. Light yellowish grey.
98-116	005a	G	1	Schist	73.x 18 x 13	19	Smoothed on all faces, recent break on edge. Blackened on one face. Yellowish grey.
98-118	006d	G	1	Schist	64 x 17x 11	25	Longitudinally split mid. piece. Smoothed on three faces. Dark grey.
98-119	006d	G	1	Schist	102.5 x 13 x 9	23	All faces smoothed. Dark grey w. reddish tint.
99-257	107	A	1	Schist	68 x 15 x 11	24	Split longitudinally but kept in use, all faces smoothed to varying degrees. Light yellowish grey.
99-259	121	A	1	Schist	30 x 18 x 3	4	Endpiece, all faces smoothed. Medium grey w. yellow tint.
99-260	132	AB	1	Schist	101x 21 x 13.5	44	Side frag. Longitudinally split, 3 faces smoothed. Dished fr. use + one face w. point sharpening grooves. Yellowish light grey.
99-268	008 SEq	G	3	Schist	55 x 16 x 5	6	3 frags. from same end piece. Perforated at both ends + split longitudinally. Smoothed on 3 faces. Yellowish-grey.
99-270	001	Z	2	Schist	82 x 39 x 15	77	Mid-piece, broken longitudinally, smoothed on 2 faces + partially on 1 face. Dark grey w. yellow tint.
99-271	1215	Z	1	Schist	108 x 22.5 x 12	51	Prob. mid-piece longitudinally split, smoothed on 3 faces. Medium grey.
99-273	1504	Z	1	Schist	36 x 14.5 x 5.5	6	Prob. end-piece, w. partially drilled hole on 1 face. Longitudinally split, smoothed on 3 faces. Light yellowish-grey.
99-274	1509	Z	1	Schist	112.5 x 23 x 6.5	56	End-piece. Split longitudinally but prob. used after, smoothed to varying degrees on all faces. Dished through use. Light yellowish-grey.

Table 9.12 Summary of whetstones

Different wear patterns on them can also be discerned, primarily, flat/concave wear indicates sharpening of blades (i.e. scissors/shears, knives) while grooved wear, needle points etc..

9.56 Pottery

All positively identified ceramics came from modern levels and comprised a substantial proportion of the modern material recovered. A few very degraded crumbs maybe early coarseware types but these need to be further studied. Of the later ceramics, all are 19th/early 20th century in date. The majority are creamwares, followed by whitewares/pearlwares, suggesting the assemblage may be earlier 19th century. Redwares, are rare as are porcelain and stonewares. Many decorated sherds occurred, mostly transfer-printed types. A more detailed discussion of the ceramics will be made in later reports.

Fabric Type	**Count**	**Weight (g)**
Coarseware	10	1
Creamware	175	559
Pearlware/whitewares	59	153
Porcelain	29	82
Redware	6	29
Stoneware	5	148
Total	*285*	*970*

Table 9.13 Summary of Pottery

9.57 Structural Fittings

Two types of structural ironwork are discussed here, nails and clench-bolts. 5 main types of nail were distinguished which have possible chronological implications:

Oval shaped: Flat Oval/D-shaped head, with eccentrically set square- or rectangular sectioned shaft. Probably wrought. Size varies.

T-shaped: Square/rectangular head and shaft section. Probably wrought. Size varies.

L-shaped: Square/rectangular head and shaft section. Probably wrought. Size varies.

Wedge shaped: No head or burred head. Shaft square sectioned. Probably wrought, early type (Viking). Size varies.
Round-headed: square/rectangule shaft with a small round head; many of these are clearly machine-made and modern.

The oval-headed types predominantly come from G and are probably therefore Viking types; T-shaped types come from G and Z suggesting a Viking and Medieval date, while L-shaped types are almost exclusively in Z indicating a Medieval date. The round-headed types are, as already mentioned, probably modern on the whole. The wedge-shaped types are comparable to the T-shaped types in distribution and therefore possibly of Viking and Medieval date. This chronology must be regarded as only preliminary, based as they are on Area ascriptions rather than contextual association.

Area	Roundheaded/ Unknown	L-shaped	Oval-headed	T-shaped	Wedge-shaped	Grand Total
A	27	1	2	0	0	*30*
AB	6	0	2	0	0	*8*
D	3	0	2	0	0	*5*
E	7	0	2	0	0	*9*
G	29	0	10	3	4	*46*
Z	45	15	4	8	4	*76*
Grand Total	*117*	*16*	*22*	*11*	*8*	*174*

Table 9.14 Summary of nails

Another fairly common type of structural ironwork are clench-bolts, small iron nails with a plate (rove) around which the tip is bent, and which are used in ship-building but also other stave-constructions. Examples from Hoftsaðir come from all periods.

Finds No.	Context	Area	Qty	Dimensions	Weight (g)	Notes
98-031	004	G	1	31 long/rove 32x18/shaft 6 diameter/bolt 13x11	14	With diamond shaped rove and sub-square bolt.
98-048	006d	G	1	26 long/rove 24x20/bolt 13x11/shaft diameter 6.5	14	Rectangular rove + bolt.
98-059	006n	G	1	51.5 long/rove 27.5x22/bolt 23x21/shaft 7 wide	22	Raised rove + wood attached.
99-037	107	A	1	29.5 long/rove diameter 13/bolt 13.5x8/shaft 7x6	5	Wrought ? w. raised head + oval bolt. Shaft tapering from top to base.
99-038	107	A	1	31 long/rove 16x11.5/shaft 6x4	5	Wrought? w. oval head, bent shaft and flat bolt (tip missing?).
99-161	1503	Z	1	16 long/rove 19x17.5/bolt 18.5/shaft 15x13.5	8	W. raised rectangular rove and D-shaped bolt.
99-064	182	A	1	23.5 long	6	Rove fragmented, shaft prob, sq. sectioned.
99-088	004	G	1	30 long/shaft 5x4.5	4	Prob. a broken clench bolt. Head prob. originally oval. Wrought?

Table 9.15 Summary of Clench-bolts

9.6 LIST OF FINDS FROM 1999

Finds no.	Context	Area	Quantity	Object	Type	Material Category	Material type
99-001	001	A	1	Nail		Metal	Fe
99-002	001	A	1	Nail?		Metal	Fe
99-003	001	A	1	Fitting?		Metal	Fe
99-004	001	A	1	File		Metal	Fe
99-005	001	A	1	Unknown		Metal	Fe
99-006	001	A	1	Rivet?		Metal	Fe
99-007	001	A	1	Nail/Tack		Metal	Fe
99-008	100	A	1	Nail		Metal	Fe
99-009	100	A	2	Unknown		Metal	Fe
99-010	100	A	4	Unknown		Metal	Fe
99-011	100	A	1	Nail		Metal	Fe
99-012	107	A	1	Horseshoe		Metal	Fe
99-013	107	A	1	Scissors		Metal	Fe
99-014	107	A	1	Scissors		Metal	Fe
99-015	107	A	1	Nail		Metal	Fe
99-016	107	A	1	Nail		Metal	Fe
99-017	107	A	1	Nail		Metal	Fe
99-018	107	A	1	Stud		Metal	Fe
99-019	107	A	1	Nail	L-shaped	Metal	Fe
99-020	107	A	1	Staple	Rectangular	Metal	Fe
99-021	107	A	2	Pin		Metal	Fe
99-022	107	A	7	Fitting?		Metal	Fe
99-023	107	A	2	Fitting?		Metal	Fe
99-024	107	A	1	Rivet/Stud		Metal	Cu alloy
99-025	107	A	1	Nail		Metal	Fe
99-026	107	A	2	Nail?		Metal	Fe
99-027	107	A	3	Unknown		Metal	Fe
99-028	107	A	1	Rivet/Bolt		Metal	Fe
99-029	107	A	1	Finial		Metal	Fe/Cu alloy
99-030	107	A	1	Knife?		Metal	Fe
99-031	107	A	1	Fitting		Metal	Fe
99-032	107	A	3	Fitting?		Metal	Fe
99-033	107	A	30	Fitting		Metal	Fe
99-034	107	A	1	Horse shoe		Metal	Fe
99-035	107	A	1	Staple	U-shaped	Metal	Fe
99-036	107	A	2	Unknown		Metal	Fe
99-037	107	A	1	Clench bolt		Metal	Fe
99-038	107	A	1	Clench bolt		Metal	Fe
99-039	107	A	1	Nail	Oval headed	Metal	Fe
99-040	107	A	1	Nail		Metal	Fe
99-041	107	A	1	Nail		Metal	Fe
99-042	107	A	1	Nail		Metal	Fe
99-043	107	A	1	Nail		Metal	Fe
99-044	107	A	1	Nail		Metal	Fe
99-045	107	A	1	Nail		Metal	Fe
99-046	107	A	1	Nail		Metal	Fe
99-047	107	A	1	Nail		Metal	Fe
99-048	107	A	1	Nail		Metal	Fe
99-049	107	A	1	Nail		Metal	Fe
99-050	107	A	1	Nail		Metal	Fe
99-051	107	A	1	Nail?		Metal	Fe
99-052	107	A	1	Unknown		Metal	Fe
99-053	107	A	2	Unknown		Composite	Cu alloy/Wood
99-054	115	A	1	Nail	Oval headed	Metal	Fe
99-055	115	A	1	Rumbler bell		Metal	Tin?
99-056	115	A	1	Fastening		Metal	Fe
99-057	115	A	1	Button		Metal	Pb alloy
99-058	121	A	1	Nail		Metal	Fe
99-059	121	A	1	Nail		Metal	Fe
99-060	121	A	2	Fitting?		Metal	Fe
99-061	139	A	1	Button		Metal	Cu alloy
99-062	157	A	1	Unknown		Metal	Fe
99-063	178	A	1	Button		Metal	Pb alloy
99-064	182	A	1	Clench bolt/Bolt		Metal	Fe
99-065	001	AB	1	Staple	U-shaped	Metal	Fe
99-066	001	AB	1	Tool		Metal	Fe
99-067	001	AB	1	Spike		Metal	Fe
99-068	001	AB	1	Spade handle		Composite	Fe/Wood
99-069	132b	AB	3	Unknown		Metal	Cu alloy
99-070	133	AB	1	Nail?		Metal	Fe
99-071	133	AB	1	Nail/Bolt		Metal	Fe
99-072	133	AB	1	Unknown		Metal	Fe
99-073	134	AB	1	Unknown		Metal	Fe
99-074	136 NE	AB	1	Pin?		Metal	Cu alloy
99-075	136	AB	1	Nail/Tack		Metal	Fe

99-076	154 SEq	AB	1	Unknown		Metal	Fe
99-077	155 NEq	AB	1	Nail?		Metal	Fe
99-078	172b	AB	1	Nail/Tack		Metal	Fe
99-079	172b	AB	1	Unknown		Metal	Fe
99-080	172b	AB	4	Unknown		Metal	Fe
99-081	172b	AB	1	Nail/Bolt?		Metal	Fe
99-082	190	AB	1	Unknown		Metal	Fe
99-083	190	AB	1	Nail	Oval headed	Metal	Fe
99-084	192	AB	5	Unknown		Metal	Fe
99-085	203	AB	1	Unknown		Metal	Fe
99-086	206	AB	1	Nail/Tack	Oval headed	Metal	Fe
99-087	004	G	1	Nail/Tack	Oval headed	Metal	Fe
99-088	004	G	1	Clench bolt?		Metal	Fe
99-089	004	G	1	Unknown		Metal	Fe
99-090	004-007	G	1	Unknown		Metal	Fe
99-091	008	G	1	Unknown		Metal	Fe
99-092	008	G	1	Nail?		Metal	Fe
99-093	008 NEq	G	1	Hook		Metal	Cu alloy
99-094	014	G	1	Nail/Tack	Wedgeshaped	Metal	Fe
99-095	u/s	Z	1	Nail	L-shaped	Metal	Fe
99-096	u/s	Z	2	Nail?		Metal	Fe
99-097	001	Z	1	Bracket piece		Metal	Fe
99-098	001	Z	2	Vessel/Cauldron		Metal	Fe
99-099	001	Z	1	Nail		Composite	Fe/Wood
99-100	001	Z	1	Hook		Metal	Fe
99-101	001	Z	1	Unknown		Metal	Fe
99-102	001	Z	1	Nail/Bolt		Metal	Fe
99-103	001	Z	1	Nail	L-shaped	Metal	Fe
99-104	001	Z	1	Nail	L-shaped	Metal	Fe
99-105	001	Z	1	Nail	Wedgeshaped?	Metal	Fe
99-106	001	Z	1	Unknown		Metal	Fe
99-107	001	Z	1	Nail	T-shaped	Metal	Fe
99-108	001	Z	1	Nail	T-shaped	Metal	Fe
99-109	001	Z	1	Nail	L-shaped	Metal	Fe
99-110	001	Z	1	Nail	L-shaped?	Metal	Fe
99-111	001	Z	1	Nail		Metal	Fe
99-112	001	Z	1	Nail		Metal	Fe
99-113	001	Z	1	Nail		Metal	Fe
99-114	001	Z	1	Nail		Metal	Fe
99-115	001	Z	1	Nail	Wired?	Metal	Fe
99-116	001	Z	1	Nail	Oval headed	Metal	Fe
99-117	001	Z	1	Nail	Oval headed	Metal	Fe
99-118	001	Z	1	Nail	L-shaped	Metal	Fe
99-119	001	Z	1	Nail	L-shaped	Metal	Fe
99-120	001	Z	1	Nail	L-shaped	Metal	Fe
99-121	001	Z	1	Nail	T-shaped	Metal	Fe
99-122	001	Z	1	Nail?		Metal	Fe
99-123	001	Z	1	Unknown		Metal	Fe
99-124	001	Z	1	Nail?	L-shaped??	Metal	Fe
99-125	001	Z	1	Candleholder/Spike		Metal	Fe
99-126	001	Z	1	Cold set?		Metal	Fe
99-127	001	Z	1	Nail	L-shaped?	Metal	Fe
99-128	001	Z	1	Tool socket		Metal	Fe
99-129	001	Z	1	Horse shoe		Metal	Fe
99-130	001	Z	1	Horse shoe		Metal	Fe
99-131	001	Z	2	Vessel		Metal	Fe
99-132	001	Z	1	Vessel		Metal	Fe
99-133	001	Z	1	Unknown		Metal	Fe
99-134	001	Z	2	Unknown		Metal	Fe
99-135	001	Z	1	Unknown		Metal	Cu alloy
99-136	001	Z	1	Unknown		Metal	Cu alloy
99-137	1503	Z	2	Trough?		Metal	Fe
99-138	1503	Z	2	Vessel		Metal	Fe
99-139	1503	Z	1	Nail/Hook		Metal	Fe
99-140	1503	Z	1	Nail		Metal	Fe
99-141	1503	Z	1	Nail		Metal	Fe
99-142	1503	Z	1	Tack	L-shaped?	Metal	Fe
99-143	1503	Z	1	Tack	L-shaped?	Metal	Fe
99-144	1503	Z	1	Tack		Metal	Fe
99-145	1503	Z	1	Tack	L-shaped?	Metal	Fe
99-146	1503	Z	1	Nail		Metal	Fe
99-147	1503	Z	2	Nail		Metal	Fe
99-148	1503	Z	1	Nail		Metal	Fe
99-149	1503	Z	1	Nail		Metal	Fe
99-150	1503	Z	1	Nail		Metal	Fe
99-151	1503	Z	1	Nail	L-shaped	Metal	Fe
99-152	1503	Z	1	Nail/Tack		Metal	Fe
99-153	1503	Z	1	Nail/Bolt	L-shaped?	Metal	Fe
99-154	1503	Z	1	Nail		Metal	Fe
99-155	1503	Z	1	Nail		Metal	Fe

99-156	1503	Z	1	Nail/Bolt		Composite	Fe/Wood
99-157	1503	Z	1	Nail/Spike	Wedgeshaped?	Metal	Fe
99-158	1503	Z	1	Nail		Metal	Fe
99-159	1503	Z	1	Nail	Oval headed?	Metal	Fe
99-160	1503	Z	1	Nail/Tack		Metal	Fe
99-161	1503	Z	1	Clench bolt		Metal	Fe
99-162	1503	Z	1	Nail	Wedgeshaped?	Metal	Fe
99-163	1503	Z	1	Collar		Metal	Fe
99-164	1503	Z	1	Unknown		Metal	Fe
99-165	1503	Z	1	Buckle		Metal	Fe
99-166	1503	Z	5	Unknown		Metal	Fe
99-167	1503	Z	1	Unknown		Metal	Fe
99-168	1503	Z	1	Horse shoe?		Metal	Fe
99-169	1503	Z	1	Unknown		Metal	Fe
99-170	1503	Z	1	Knife	Whittle-tanged	Metal	Fe
99-171	1503	Z	1	Fitting		Metal	Cu alloy
99-172	1503	Z	1	Unknown		Metal	Cu alloy
99-173	1503	Z	1	Unknown		Metal	Cu alloy
99-174	1503	Z	1	Fitting?		Metal	Cu alloy
99-175	1504	Z	1	Unknown		Metal	Fe
99-176	1504	Z	2	Fitting?		Metal	Fe
99-177	1506	Z	1	Nail		Metal	Fe
99-178	1506	Z	1	Nail?		Metal	Fe
99-179	1508	Z	1	Staple	U-shaped	Metal	Fe
99-180	1508	Z	1	Rivet		Metal	Fe
99-181	1510	Z	1	Buckle	D-shaped	Metal	Cu alloy
99-182	1511	Z	1	Nail??		Metal	Fe
99-183	1512	Z	1	Nail		Metal	Fe
99-184	1512	Z	1	Nail?		Metal	Fe
99-185	1512	Z	1	Nail/Tack		Metal	Fe
99-186	1512	Z	1	Needle/Pin		Metal	Fe
99-187	1512	Z	1	Pin?		Metal	Fe
99-188	1512	Z	3	Fitting?		Metal	Cu alloy
99-189	1512	Z	1	Pin?		Metal	Cu alloy
99-190	1512	Z	1	Finial		Metal	Cu alloy
99-191	1514	Z	6	Vessel?		Metal	Fe
99-192	1517	Z	1	Staple	U-shaped	Metal	Fe
99-193	1518	Z	1	Unknown		Metal	Fe
99-194	1521	Z	1	Nail	T-shaped	Metal	Fe
99-195	1522	Z	1	Knife		Metal	Fe
99-196	1522	Z	3	Unknown		Metal	Fe
99-197	1522	Z	1	Nail?		Metal	Fe
99-198	1522	Z	1	Unknown		Metal	Fe
99-199	1522	Z	1	Unknown		Metal	Fe
99-200	1522	Z	1	Nail		Metal	Fe
99-201	1522	Z	1	Nail/Bolt?		Metal	Fe
99-202	1522	Z	1	Nail/Tack		Metal	Fe
99-203	1522	Z	1	Nail/Tack		Metal	Fe
99-204	1523	Z	1	Nail		Metal	Fe
99-205	1523	Z	1	Nail	T-shaped	Metal	Fe
99-206	1523	Z	1	Nail		Metal	Fe
99-207	1523	Z	1	Nail?	L-shaped?	Metal	Fe
99-208	1523	Z	1	Nail/Tack		Metal	Fe
99-209	1523	Z	1	Nail/Tack		Metal	Fe
99-210	1523	Z	1	Unknown		Metal	Cu alloy
99-211	1523	Z	1	Nail/Tack	Oval headed	Metal	Fe
99-212	1523	Z	1	Unknown		Metal	Fe
99-213	1523	Z	1	Fitting?		Metal	Fe
99-214	1523	Z	3	Unknown		Metal	Cu alloy
99-215	1528	Z	1	Nail	T-shaped	Metal	Fe
99-216	1528	Z	1	Nail	T-shaped	Metal	Fe
99-217	1528	Z	2	Fitting?		Metal	Cu alloy
99-218	1533	Z	1	Nail/Bolt?		Metal	Fe
99-219	1536	Z	1	Nail	L-shaped	Metal	Fe
99-220	1536	Z	1	Nail	L-shaped	Metal	Fe
99-221	1536	Z	1	Fitting		Metal	Cu alloy
99-222	1537	Z	1	Nail		Metal	Fe
99-223	1537	Z	1	Nail/Tack		Metal	Fe
99-224	1538	Z	1	Nail	T-shaped	Metal	Fe
99-225	1538	Z	1	Nail	Wedgeshaped	Metal	Fe
99-226	1538	Z	1	Nail		Metal	Fe
99-227	1538	Z	1	Nail		Metal	Fe
99-228	1538	Z	1	Nail?		Metal	Fe
99-229	1538	Z	1	Scissors		Metal	Fe
99-230	1557	Z	1	Unknown		Metal	Fe
99-231	1557	Z	1	Unknown		Metal	Fe
99-232	1557	Z	1	Weight?		Metal	Pb
99-233	004	G	1	Unknown		Metal	Cu alloy
99-234	100	A		Industrial waste		Slag	
99-235	107	A		Industrial waste		Slag	

99-236	115	A		Industrial waste		Slag	
99-237	121	A		Industrial waste		Slag	
99-238	136	AB		Industrial waste		Slag	Fe
99-239	137	AB		Industrial waste		Slag	
99-240	155	AB		Industrial waste		Slag	
99-241	159 NEq	AB		Industrial waste		Slag	
99-242	159 NWq	AB		Industrial waste		Slag	
99-243	160 NWq	AB		Industrial waste		Slag	
99-244	171 NEq	AB		Industrial waste		Slag	Fe
99-245	179	AB		Industrial waste		Slag	
99-246	187 NWq	AB		Industrial waste		Slag	Fe
99-247	190	AB		Industrial waste		Slag	Fe
99-248	192	AB		Industrial waste		Slag	Fe
99-249	194	AB		Industrial waste		Slag	
99-250	197	AB		Industrial waste		Slag	
99-251	004	G		Industrial waste		Slag	
99-252	008	G		Industrial waste		Slag	Fe
99-253	008 NWq	G		Industrial waste		Slag	
99-254	008f	G		Industrial waste		Slag	
99-255	1522	Z		Industrial waste		Slag	
99-256	1536	Z		Industrial waste		Slag	
99-257	107	A	1	Whetstone		Stone	Schist?
99-258	115	A	1	Unknown		Stone	Flint
99-259	121	A	1	Whetstone		Stone	Schist?
99-260	132	AB	1	Whetstone		Stone	Schist?
99-261	136	AB	1	Debitage		Stone	Flint
99-262	187 NWq	AB	1	Debitage		Stone	Flint
99-263	008	G	2	Spindle whorl	Type B	Stone	Steatite
99-264	008 NEq	G	1	Spindle whorl	Type C	Stone	Steatite
99-265	008 NWq	G	1	Unknown		Stone	Basalt?
99-266	008 SWq	G	1	Loomweight		Stone	Basalt?
99-267	008 SWq	G	1	Loomweight		Stone	Basalt?
99-268	008 SEq	G	3	Whetstone		Stone	Schist?
99-269	013	G	1	Loomweight		Stone	Basalt?
99-270	001	Z	2	Whetstone		Stone	Schist?
99-271	1215	Z	1	Whetstone		Stone	Schist?
99-272	1503	Z	1	Vessel		Stone	Steatite
99-273	1504	Z	1	Whetstone		Stone	Schist?
99-274	1509	Z	1	Whetstone		Stone	Schist?
99-275	1514	Z	1	Spindle whorl	Type B	Stone	Steatite
99-276	1528	Z	3	Unknown		Stone	
99-277	1538	Z	1	Unknown		Stone	Obsidian
99-278	171 NWq	AB	1	Pin		Bone	
99-279	100	A	2	Unknown		Wood	
99-280	107	A	2	Unknown		Wood	
99-281	107	A	2	Unknown		Wood	
99-282	107	A	1	Unknown		Wood	
99-283	139	A	2	Unknown		Wood	
99-284	153	A	6	Unknown		Wood	
99-285	158	A	11	Unknown		Wood	
99-286	001	Z	1	Unknown		Wood	
99-287	1522	Z	4	Unknown		Wood	
99-288	1534	Z	1	Unknown		Wood	
99-289	171	AB		Unknown		Wood	
99-290	107	A	1	Clothing?		Textile	Wool?
99-291	107	A	3	Clothing?		Textile	Wool?
99-292	107	A	1	Clothing?		Textile	Wool?
99-293	121	A	1	Claypipe		Clay	
99-294	155b NWq	AB	1	Bead		Clay	
99-295	1503	Z	1	Claypipe		Clay	
99-296	u/s	A	1	Unknown		Pot	Whiteware
99-297	001	A	2	Cup/Bowl		Pot	Creamware
99-298	001	A	4	Bowl		Pot	Creamware
99-299	001	A	4	Flatware		Pot	Creamware
99-300	001	A	1	Cup?		Pot	Whiteware
99-301	001	A	1	Vessel		Pot	Pearlware?
99-302	001	A	1	Plate		Pot	Whiteware
99-303	001	A	1	Plate		Pot	Creamware
99-304	001	A	1	Vessel?		Pot	Whiteware
99-305	001	A	2	Vessel?		Pot	Whiteware?
99-306	001	A	1	Vessel?		Pot	Whiteware?
99-307	100	A	1	Jug		Pot	Stoneware
99-308	100	A	1	Cup		Pot	Creamware
99-309	100	A	4	Vessel		Pot	Creamware
99-310	100	A	8	Plate		Pot	Creamware
99-311	100	A	2	Cup/Bowl		Pot	Creamware
99-312	100	A	3	Plate		Pot	Whiteware
99-313	100	A	1	Plate		Pot	Whiteware
99-314	107	A	1	Vessel?		Pot	Redware

99-315	107	A	1	Vessel	Pot	Redware
99-316	107	A	1	Jar	Pot	Stoneware
99-317	107	A	1	Cup	Pot	Porcelain
99-318	107	A	28	Bowl	Pot	White/Pearlware
99-319	107	A	10	Plate	Pot	Whiteware
99-320	107	A	1	Vessel?	Pot	Whiteware
99-321	107	A	1	Vessel?	Pot	Whiteware
99-322	107	A	1	Vessel?	Pot	Whiteware
99-323	107	A	1	Vessel?	Pot	Whiteware
99-324	107	A	1	Vessel?	Pot	Creamware
99-325	107	A	2	Plate	Pot	Creamware
99-326	107	A	3	Bowl	Pot	Whiteware
99-327	107	A	1	Cup	Pot	Creamware
99-328	107	A	2	Cup	Pot	Creamware
99-329	107	A	1	Plate	Pot	Creamware
99-330	107	A	2	Bowl	Pot	Creamware
99-331	107	A	1	Bowl	Pot	Whiteware
99-332	107	A	1	Plate	Pot	Creamware
99-333	107	A	1	Plate	Pot	Creamware
99-334	107	A	1	Plate	Pot	Creamware
99-335	107	A	1	Cup/Bowl	Pot	Creamware
99-336	107	A	3	Cup/Bowl	Pot	Creamware
99-337	107	A	1	Cup	Pot	Pearlware?
99-338	107	A	1	Cup/Bowl	Pot	Creamware
99-339	107	A	1	Vessel?	Pot	Creamware
99-340	107	A	1	Bowl	Pot	Creamware
99-341	107	A	75	Unknown	Pot	Creamware
99-342	115	A	1	Bottle/Jar	Pot	Stoneware
99-343	115	A	1	Vessel?	Pot	Creamware
99-344	115	A	1	Cup	Pot	Creamware
99-345	115	A	3	Cup/Bowl	Pot	Creamware
99-346	115	A	1	Plate	Pot	Creamware
99-347	115	A	1	Vessel?	Pot	Creamware
99-348	115	A	6	Vessel?	Pot	Creamware
99-349	121	A	3	Vessel?	Pot	Redware
99-350	121	A	1	Teapot?	Pot	Creamware
99-351	121	A	1	Plate/Dish	Pot	Whiteware
99-352	121	A	4	Unknown	Pot	Creamware
99-353	153	A	1	Vessel?	Pot	Creamware
99-354	157	A	1	Bottle/Jar	Pot	Stoneware
99-355	001	AB	1	Unknown	Pot	Whiteware
99-356	001	AB	2	Vessel?	Pot	Creamware
99-357	002	AB	1	Unknown	Pot	Whiteware
99-358	016	G	2	Unknown	Pot	Creamware
99-359	016	G	1	Unknown	Pot	Whiteware
99-360	001	Z	1	Pipkin	Pot	Redware
99-361	001	Z	1	Cup/Bowl	Pot	Creamware
99-362	001	Z	1	Cup/Bowl	Pot	Creamware
99-363	001	Z	1	Unknown	Pot	Creamware
99-364	001	Z	6	Cup	Pot	Whiteware
99-365	1512	Z	1	Vessel	Pot	Whiteware
99-366	1522	Z	1	Cup/Bowl	Pot	Creamware
99-367	1537	Z	4	Vessel	Pot	Creamware
99-368	1537	Z	1	Vessel	Pot	Whiteware?
99-369	u/s	A	1	Bottle	Glass	
99-370	001	A	1	Bottle	Glass	
99-371	001	A	1	Window	Glass	
99-372	100	A	1	Bottle	Glass	
99-373	100	A	1	Bottle	Glass	
99-374	100	A	5	Bottle	Glass	
99-375	100	A	1	Bottle	Glass	
99-376	100	A	2	Vessel?	Glass	
99-377	100	A	1	Vessel?	Glass	
99-378	107	A	1	Bottle	Glass	
99-379	107	A	2	Bottle	Glass	
99-380	107	A	1	Bottle	Glass	
99-381	107	A	1	Vessel?	Glass	
99-382	107	A	2	Vessel	Glass	
99-383	107	A	2	Vessel	Glass	
99-384	107	A	2	Vessel	Glass	
99-385	107	A	3	Vessel	Glass	
99-386	107	A	1	Vessel	Glass	
99-387	107	A	4	Window	Glass	
99-388	107	A	2	Window	Glass	
99-389	107	A	4	Window	Glass	
99-390	107	A	1	Window?	Glass	
99-391	107	A	4	Vessel	Glass	
99-392	107	A	1	Bottle	Glass	
99-393	107	A	1	Vessel	Glass	
99-394	121	A	2	Window	Glass	

99-395	136	AB	1	Bead	Glass
99-396	004	G	1	Bead	Glass
99-397	004	G	1	Bead	Glass
99-398	001	Z	3	Bottle	Glass
99-399	001	Z	2	Window	Glass
99-400	1215	Z	3	Vessel?	Glass
99-401	1503	Z	1	Vessel	Glass
99-402	1522	Z	1	Bottle	Glass
99-403	1529	Z	1	Bead	Glass
99-404	107	A	1	Unknown	Stone

10. DISCUSSION

The results of this seasons investigations have proved once again, the richness and potential of this site. The relative success of the geophysical survey requires that these methods continue to be applied across the whole site to aid future excavation strategy. The presence of well-preserved human remains and, despite bulldozing, the traces of a structure in the chapel area, suggest that this and more generally, the farm mound will prove a rich source of information about the Medieval and post-Medieval occupation of the site. Finally and perhaps most interesting of all, the continued excavation of the area around the long hall is once again showing the complexity of the first settlement - there are now seven structures identified beyond the long hall, some of which probably pre-date it, and some post-date it.

Each of the excavation areas together have clearly shown the complexity of the site, its multi-phased nature and the number of 'satellite' structures around the longhouse. However, the precise relationship between these structures and subsequently the developmental sequence of the site remains only thinly understood. For example, Structures A2, A3, E1, E2, D1 and D2 are all later additions or subsidiary structures to the longhouse AB. Moreover, while it seems that E2 is earlier than E1 and D1 earlier than D2, (i.e. the free-standing structures predate the elongated porches/connecting passages) the relation between these and A2 and A3 remain unknown. However, while all internal features of A3 have been truncated, A2 is unlike the structures in D and E in having no postholes, but rather stone pads, similar to the longhouse, which may suggest, on construction styles, it is earlier than the structures in D and E. Second, the relation between the longhouse AB and pithouse G is not entirely unambiguous - one view is that the pit house pre-dates the longhouse and is a temporary dwelling before the construction of the longhouse (see Vestéinsson, this report). Certainly the sheer quantity of midden deposits infilling the pit house, the uppermost of which appears to lap up against the longhouse walls and go under at least one of its additions (D2) might suggest this. While there can be no doubt the structure in G is among the earliest features on site, both on stratigraphic and radiocarbon grounds, there is no direct evidence, so far, that it pre-dates the longhouse. The key deposit in resolving this issue is [0014], a layer of upcast which predates the pithouse and lies over an aeolian layer [0017]. This upcast was traced in Area A in 1998 (as [122]) and spreads north and west of the pit house; while it does not extend as far as the longhouse, an aeolian layer beneath it [0017], almost certainly does and may provide the answer.

The upcast layer [0014]/[122] also raises questions of its derivation and only one real answer seems to present itself at this stage: another sunken building to the southwest of the longhouse or northwest of G. The presence of Hekla 3 in the upcast points to a deep excavation (thus is unlikely to come from the longhouse which only penetrates the Landnám Layer), while its spatial spread suggests the posited location (again arguing against a longhouse derivation). Whether a deep structure like G or shallower as structures A4 and A5 to the east remains to be seen, but there is no substantial depression on the surface suggesting it may be the latter. In summary then, all the evidence so far points to these pit houses being the earliest on site, while the upstanding buildings being the latest with the longhouse floating somewhere in between. Any more refined phasing within this must await further work, both the continued excavation of the areas already open and the need to link up areas, in particular A and D and D and E.

The present coarse phasing however, taken at face value, suggests that the pithouses and later upstanding structures may have served similar purposes at different periods. As for the function of the various buildings, this is inevitably going to be equivocal but of those which have been excavated, E2 may have been a latrine (Milek, pers. comm.), with D1 and G dwellings. Structures E1 and D2 are clearly passageways and require little further comment

except to say that their construction may indicate something about changing perception of space. Structure A3 is small, comparable in size and orientation to E2, but unfortunately all internal features have been truncated to make any direct comparison possible. Structure A2, while excavated down to floor level, lacks any obvious internal features (e.g. hearth) and constructed from the start as integral to the longhouse, it may have been a storage room. The longhouse itself, structure AB, variously described as a temple or dwelling, also remains to be fully re-excavated but its use as a dwelling is probably incontrovertable. The high number of cattle skulls which have been found around the outside of this structure, interpreted as having been hung along the walls, may suggest a ritual function ('temple'), but it could equally be a status signifier, reinforcing the wealth of the occupier, also evident in the sheer size of the building. Cattle, being a major component of the farmer's wealth, their skulls would be apt metaphors for this wealth (see Tinsley, this Report).

The question surrounding the function of buildings is clearly complex and in most cases, it may be misleading to ascribe them a univocal or even leading function, as many activities probably occurred within their walls. For example, pit house G had a number of arfetacts associated with textile production (loomweights, spindlewhorls, pins). This does not mean it was a weaving shed, but that weaving probably went on inside along with other activities, including cooking, eating and sleeping. The same applies to other structures.

It is necessary not to end without saying a few words about the field bank (túngarður) enclosing the site and the present farm. No close dating evidence could be gained from trenches cut this season as in 1997; the boundary clearly predates the 15th century and post-dates the Landnám. Somewhere in between it was constructed and re-built at least three times. Only in the trench closer to the farm was a post-1477 re-build recorded, although this whole profile is much less clear than that on top of the slope above the farm. At present, two interpretations offer themselves: either the bank was constructed more or less contemporaneously with the longhouse in the 9th or 10th century or, perhaps more likely, with the re-location of the farmstead to the present farmmound in the 12th century on the assumption that its construction would accompany a major reconfiguration of the farm unit. The short chronology allows about one rebuild/maintenance every century in contrast to the longer chronology which indicates one nearly every two centuries.

All these must remain preliminary interpretations, but something of the social complexity is evident in the architectural complexity so far uncovered. Work must continue, both in completing the excavation of the structures themselves and establishing their stratigraphic relationships. Further work on the field boundary may also yet resolve the dating issue, especially if a thin section is taken to analyse for micro-tephra. The primary aims of the next season however will include opening the whole of the longhouse; establishing links between Areas A and D, and D and E; concluding the investigations of structures in A and G; and finally the extension and continuation of investigations in Area Z.

REFERENCES

Amorosi, T (1996) Zooarchaeology and Global Change in Iceland, PhD dissertation, CUNY

Amorosi, T & McGovern, T (1997) Zooarchaeology of Hofstaðir, 1996 season collections, Forneifastofnun Islands.

Barret, James (1997) Fish Trade in Norse Orkney and Caithness: a zooarchaeological approach *Antiquity* 71:616-638

Bruun, Daniel & Finnur Jonsson (1909) Om hove og hovudgravninger paa Island, *Aarboger for Nordisk Oldkyndighed Historie* 1909: 245-316.

Bullock, P., Fedoroff, N., Jongerius, A., Stoops, G., Tursina, T. and Babel, U. (1985) *Handbook for Thin Section Description*. Wolverhampton: Waine Research Publications.

Courty, M.A., Goldberg, P. and Macphail, R. (1989) *Soil Micromorphology in Archaeology*. Cambridge: Cambridge University Press.

Eldjárn, Kristján (1961) 'Bær í Gjáskógum í Þjórsárdal.' *Árbók hins íslenzka fornleifafélags 1961*, 7-46.

Friðriksson, A. and Vésteinsson, O. (1997) Hofstaðir Revisited, *Norwegian Archaeological Review* 30: 103-112.

Friðriksson, Adolf & Vésteinsson, Orri (1998) 'Fornleifarannsóknir á Hofstöðum í Mývatnssveit 1995 - Gryfja sunnan skála.' *Archaeologia islandica* I, 92-109.

Grayson, D.K (1984) Quantitative zooarchaeology: topics in the analysis of archaeological faunas. Academic Press: Orlando

Hjálmarsson, J. R. & Astridge, C. (1998) 'Lake Mývatn'. Special Iceland Review Supplement. *Iceland Review.*

Horsley, T.J. (1999) *A Preliminary Assessment of the use of Routine Geophysical Techniques for the Location, Characterisation and Interpretation and Interpretation of Buried Archaeology in Iceland.* (MSc Dissertation; University of Bradford).

Íslenskt fornbréfasafn VI. (Hið íslenska bókmenntafélag: Reykjavík).

Jorgensen, G (1977) Et kornfund fra Sarup. Bidrag til Belynsning af Tragtb230gerkulturens Agerbrug. *Kuml* 1976:47-64.

Mainland, I.L (1998b) The lamb's last supper: the role of dental microwear analysis in reconstructing livestock diet in the past. *Environmental Archaeology* 1: 55-62.

Mainland, I.L. (1998a) Dental microwear and diet in domestic sheep (Ovis aries) and goats (Capra hircus): distinguishing grazing and fodder-fed ovicaprids using a quantitative analytic approach. *Journal of Archaeological Science* 25: 1259-1271.

McGovern, T. H. (1985) Contributions to the Paleoeconomy of Norse Greenland, *Acta Archaelogica*, Vol 54:73-122.

McGovern, T.H. (1992) Bones Buildings, and Boundaries: Paleoeconomic approaches to Norse Greenland, in C.D. Morris and James Rackham (eds.), *Norse and later Settlement & Subsistence in the North Atlantic* Glasgow U. Press pp. 157-186.

McGovern, T.H. , Amorosi, T., Perdikaris, S., & Woolet, J.W. (1996) Zooarchaeology of Sadness V51: Economic Changes in a Chieftan's Farm in West Greenland, *Arctic Anthropology* 33(2)94-122.

McGovern, T.H., Bigelow, G.F., Amorosi, T., Woolet, J.W., & Perdikaris, S. (1993) Animal bones from 017a Narsaq. In Vabaek, C.L Narsaq – A Norse Landnam Farm. *Meddelser om Gronland Man and Society* 18:

McGovern, T.H., Mainland, I.L., & Amorosi, T. (1998) Hofstaðir 1996-97: A Preliminary Zooarchaeological Report, *Archaeologica Island*ica 1:123-128.

McGovern, Tom & Amorosi, Tom (1997) 'Hofstaðir 1997. Area G excavation report.' in *Hofstaðir 1997. Framvinduskýrslur*, Reykjavík, 39-48.

McGovern, Tom (1998) ‘5.0 Area G Excavation Report.’ *Hofstaðir 1998. Framvinduskýrslur/Preliminary Reports*, 60-66.

McGovern, Tom, Mainland, Ingrid & Amorosi, Tom (1996) ‘Hofstaðir 1996. A preliminary zooarchaeological report.’ in *Rannsókn á fornbýli á Hofstöðum í Mývatnssveit. Framvinduskýrslur 1996*, Reykjavík.

McGovern, Tom; Mainland, Ingrid & Amorosi, Tom (1998) ‘Hofstaðir 1996-1997. A preliminary zooarchaeological report.’ *Archaeologia islandica* I, 123-28.

Milek, K.B., Simpson, I.A. and Beveridge, S. (1998) Geoarchaeological sampling report. In A. Friðriksson and O. Vésteinsson (eds.), *Hofstaðir 1998: Framvinduskýrslur/Preliminary Reports.* Reykjavík: Fornleifastofnun Íslands Report FS062-91016, 67-83.

Murphy, C.P. (1986) *Thin Section Preparation of Soils and Sediments.* Berkhampstead: AB Academic Publishers.

Olsen, Olaf (1965) Horg, hov og kirke *Aarboger for Nordisk Oldkyndighed og Historie* 1965:5-307

Øye, I. (1988) *Textile Equipment and its Working Environment, Bryggen in Bergen c. 1150-1500* (The Bryggen Papers, Main Series Vol.2), Bergen: Norwegian University Press.

Perdikaris, Sophia (1998) From chiefly provisioning to commercial fishery: long term economic change in arctic Norway, *World Archaeology*.

Perdikaris, Sophia (1990) Aaker: a zooarchaeological perspective on a Norwegian Iron Age site, Masters Thesis (Honors), Hunter College CUNY.

Sæmundsson, K. & E. Gunnlaugsson (1999) *Íslenska Steinabókin*. Reykjavik: Mál og menning.

Sigurgeirsson, Magnús Á. (1998) ‘Gjóskulagarannsóknir á Hofstöðum 1992-1997.’ *Archaeologia islandica* I, 110-118.

Simpson, I.A., Milek, K.B., & Gudmundsson, G. (1999) A reinterpetation of the great pit at Hofstaðir, Iceland using sediment thin section micromorphology. *Geoarchaeology* 14, 511-530.

Simpson, I.A., Dugmore, A.J., Thomson, A. and Vésteinsson, O. (in press) Crossing the thresholds: Human ecology and historical patterns of land degradation. *Catena.*

Simpson, I.A., Milek, K.B. and Guðmundsson, G. (1999) A reinterpretation of the Great Pit at Hofstaðir, Iceland using sediment thin section micromorphology. *Geoarchaeology: An International Journal* 14(6): 511-530.

Vésteinsson, O. (1996) *Fornleifaskráning í Skútustaðahreppi I: Fornleifar á Hofstöðum, Helluvaði, Gautlöndum og í Hörgsdal.* (Unpublished report, Fornleifastofnun Íslands: FS022-96011).

Vésteinsson, Orri (1991) *Pit houses in Iceland. Research strategies in historical archaeology*, unpubl. MA thesis, University of London.